

**TOSHIBA**

FILE NO. 330-200002

**SERVICE MANUAL**

**3LCD DATA PROJECTOR**

***TLPB2U, TLPB2E  
TXPB2, TLPB2C***

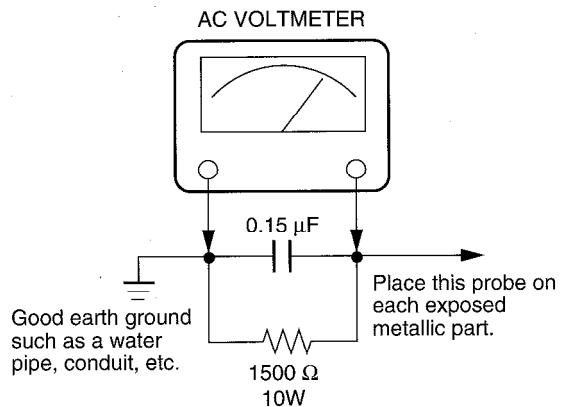


**TLPB2**

## SAFETY PRECAUTION

**WARNING:** Service should not be attempted by anyone unfamiliar with the necessary precautions on this projector. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation Transformer should be connected in the power line between the projector and the AC line before any service is performed on the projector.
2. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
3. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000ohm per volt or more sensitivity in the following manner: Connect a 1500ohm 10W resistor, paralleled by a 0.15  $\mu$ F, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500ohm resistor and 0.15  $\mu$ F capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 5.25V(rms). This corresponds to 3.5 mA(AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



## PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

## ULTRAVIOLET DANGER IN SERVICE MODE

Eye damage may result from directly viewing the light produced by the lamp used in this product. Always turn off lamp before opening this cover. Ultraviolet radiation eye protection required during servicing.

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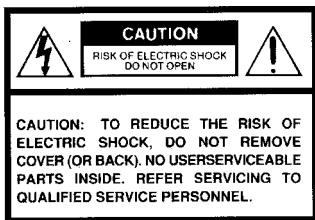
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# SAFETY PRECAUTIONS



 The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

 The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

**CAUTION:** Laser beam is emitted when the laser button of the remote control is pressed. Do not look from the front of the remote control. Do not face toward a person or to a mirror.

## FCC Radio Frequency Interference Statement

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiates radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**WARNING:** Changes or modifications made to this equipment, not expressly approved by Toshiba, or parties authorized by Toshiba, could void the user's authority to operate the equipment.

**Notice:** This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

# IMPORTANT PRECAUTIONS

## Save Original Packing Materials

The original shipping carton and packing materials will come in handy if you ever have to ship your LCD projector. For maximum protection, repack the set as it was originally packed at the factory.

In the spaces provided below, record the Model and Serial No. located at the rear of your LCD projector.

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

Retain this information for future reference.

## Avoid Volatile Liquid

Do not use volatile liquids, such as an insect spray, near the unit. Do not leave rubber or plastic products touching the unit for a long time. They will mar the finish.

## Moisture Condensation

Never operate this unit immediately after moving it from a cold location to a warm location. When the unit is exposed to such a change in temperature, moisture may condense on the crucial internal parts. To prevent the unit from possible damage, do not use the unit for at least 2 hours when there is an extreme or sudden change in temperature.

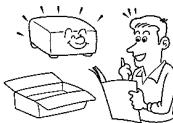
# IMPORTANT SAFETY INSTRUCTIONS

**CAUTION: PLEASE READ AND OBSERVE ALL WARNINGS AND INSTRUCTIONS GIVEN IN THIS OWNER'S MANUAL AND THOSE MARKED ON THE UNIT. RETAIN THIS BOOKLET FOR FUTURE REFERENCE.**

This set has been designed and manufactured to assure personal safety. Improper use can result in electric shock or fire hazard. The safeguards incorporated in this unit will protect you if you observe the following procedures for installation, use and servicing. This unit is fully transistorized and does not contain any parts that can be repaired by the user.  
**DO NOT REMOVE THE CABINET COVER, OR YOU MAY BE EXPOSED TO DANGEROUS VOLTAGE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.**

## 1. Read Owner's Manual

After unpacking this product, read the owner's manual carefully, and follow all the operating and other instructions.



## 2. Power Sources

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company.

For products intended to operate from battery power, or other sources, refer to the operating instructions.



## 3. Source of Light

Do not look into the lens while the lamp is on. The strong light from the lamp may cause damage to your eyes or sight.



## 4. Ventilation

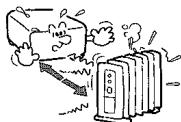
Openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.



# IMPORTANT SAFETY INSTRUCTIONS

## 5. Heat

The product should be situated away from heat sources such as radiators heat registers, stoves, or other products (including amplifiers) that produce heat.



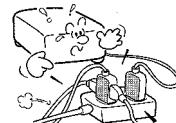
## 7. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.



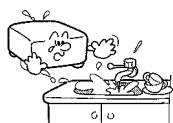
## 9. Overloading

Do not overload wall outlets; extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.



## 6. Water and Moisture

Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool and the like .



## 8. Power-Cord Protection

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.



## 10. Lightning

For added protection for this product during storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.



# IMPORTANT SAFETY INSTRUCTIONS

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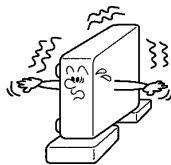
## 11. Object and Liquid Entry

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.



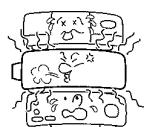
## 12. Do not place the product vertically

Do not use the product in the upright position to project the pictures at the ceiling, or any other vertical positions. It may fall down and dangerous.



## 13. Stack Inhibited

Do not stack other equipment on this product or do not place this product on the other equipment.  
Top and bottom plates of this product develops heat and may give some undesirable damage to other unit.



## 14. Attachments

Do not use attachments not recommended by the product manufacturer as they may cause hazards.

## 15. Accessories

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions and should use a mounting accessory recommended by the manufacturer.

A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.



# IMPORTANT SAFETY INSTRUCTIONS

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## 16. Damage Requiring Service

- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
- a) When the power-supply cord or plug is damaged.
  - b) If liquid has been spilled, or objects have fallen into the product.
  - c) If the product has been exposed to rain or water.
  - d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
  - e) If the product has been dropped or damaged in any way.
  - f) When the product exhibits a distinct change in performance - this indicates a need for service.

## 17. Servicing

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.



## 19. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.



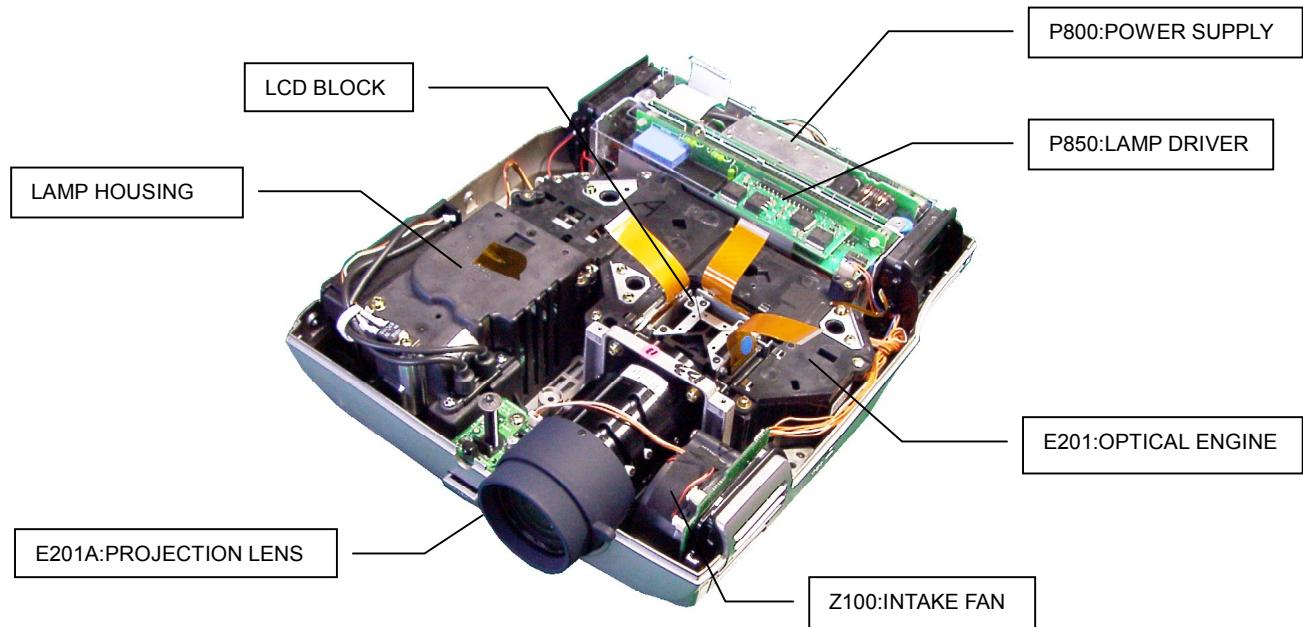
## 18. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards. (Replacement of the lamp only should be made by users.)

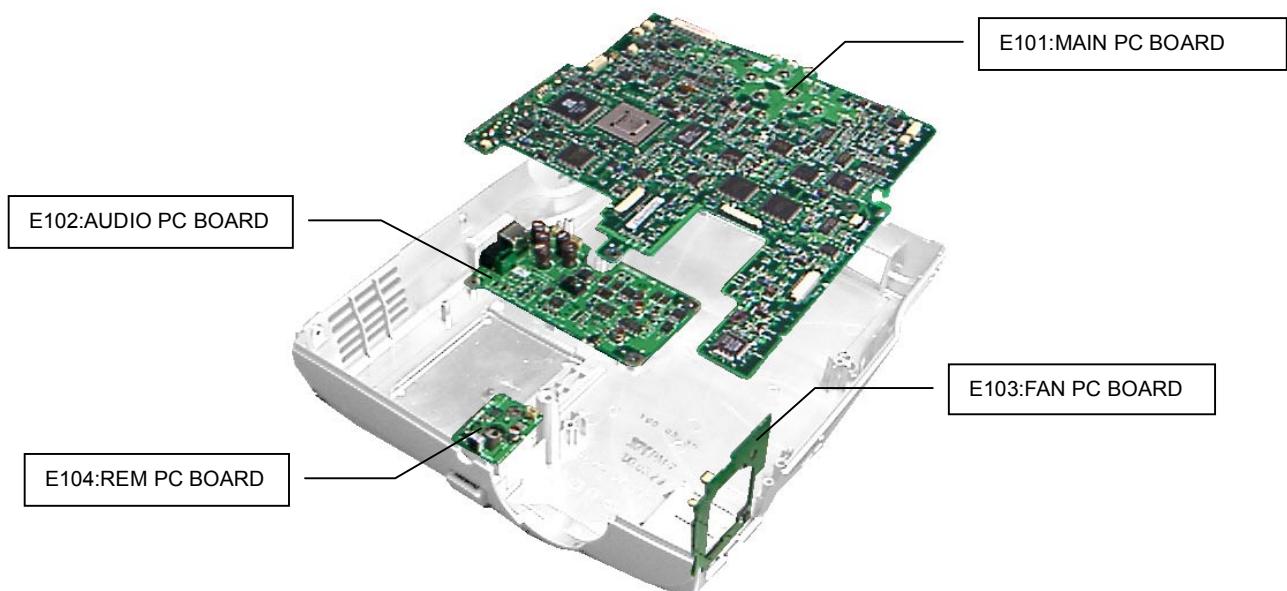
# SECTION1

## PART REPLACEMENT AND ADJUSTMENT PROCEDURES

### 1. LOCATION OF MAIN PARTS



### 2. LOCATION OF PC BOARD



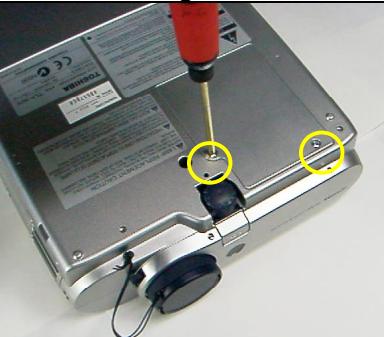
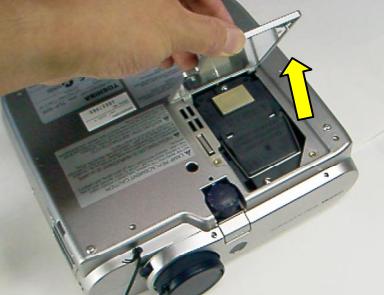
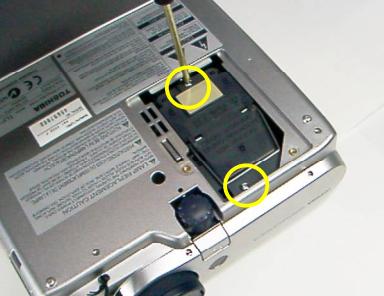
## CAUTIONS BEFORE SERVICING

Electronic parts are susceptible to static electricity and may easily be damaged, so do not forget to take proper grounding treatment as required.

Many screws are used inside the unit. To prevent missing, dropping, etc. of the screws, always use a magnetized screwdriver in servicing. Several kinds of screws are used and some of them need special cautions. That is, take care of the tapping screws securing molded parts and fine pitch screws used to secure metal parts. If they are used improperly, the screw holes will be easily damaged and the parts can not be fixed.

## 3. REPLACEMENT OF MECHANICAL PARTS

### 3-1. Lamp Assembly

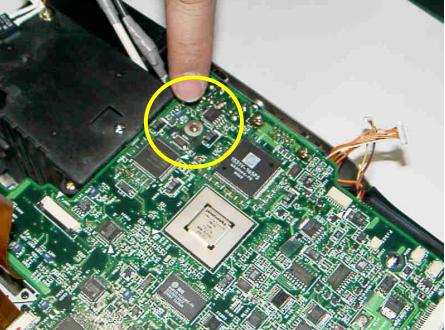
Step	Figure	Explanation
1		Remove two screws (M2.6 x 8). These screws are retained with split washers.
2		Remove the lamp cover.
3		Remove two screws that secure the lamp module (M2.6 x 8). These screws are retained with split washers.
4		Lift the lamp module out of the projector.

### 3-2. Top Cover

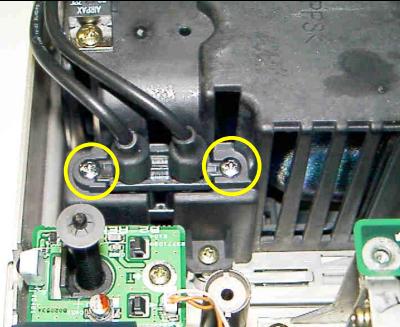
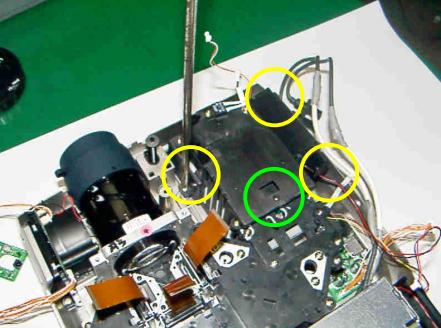
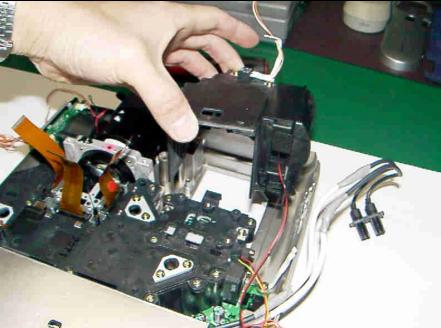
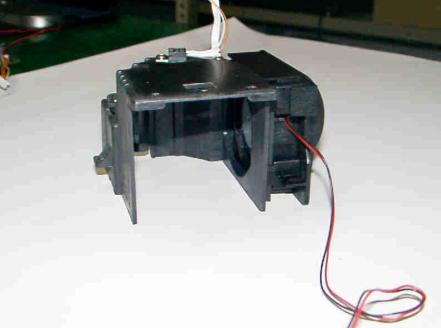
Step	Figure	Explanation
1		[Right Side] Remove four screws (M2.6 x 6). Screw : type [M-1] 
2		[Left Side] Remove three screws (M2.6 x 6). Screw : type [M-1] 
3		[Bottom] Remove one screw (M2.6 x 6). Screw : type [M-1] 
4		[Front] Remove two screws (M2 x 4). Screw : type [M-2] 
5		Remove front cover. [Note] Unsnap the bottom first, and then unsnap the top to remove.

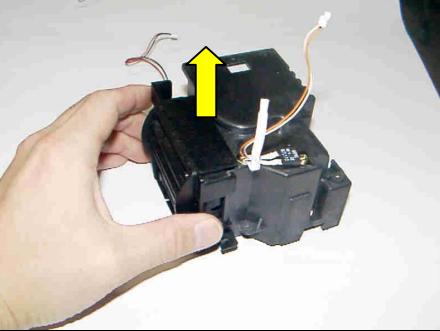
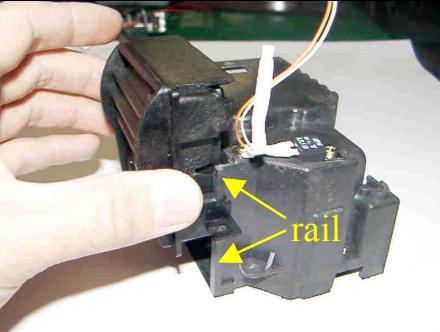
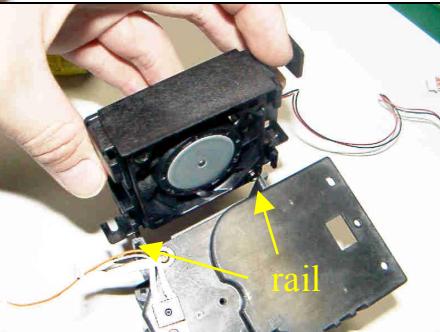
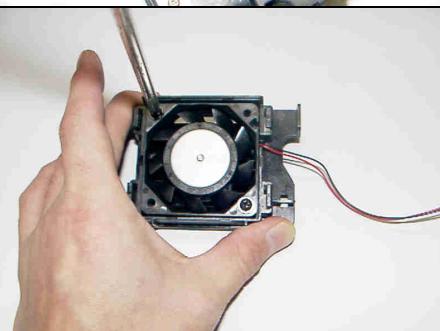
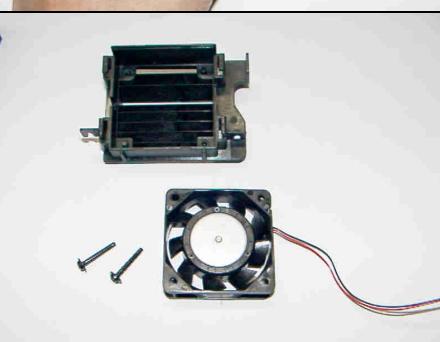
6		<p>Push cabinet upward to remove back cover.</p>
7		<p>Push down on the back cover to remove.  <b>[Note]</b>  The back cover is fixed with the adhesion tape.</p>
8		<p>Remove the top cover by lifting up on the left side of the cabinet and around the video connector.</p>

### 3-3. Main PC Board

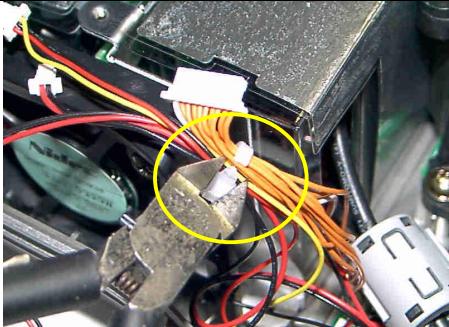
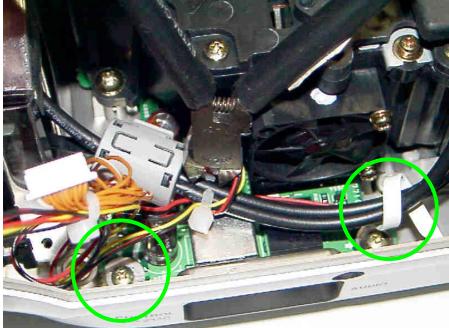
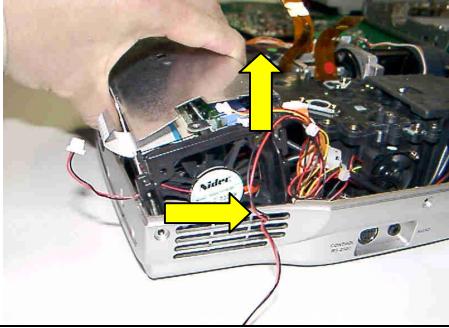
Step	Figure	Explanation
1		Remove all cables and connectors.
2		Remove five screws (M2.6 x 6). Screw : type [M-1] 
3		[Note] There is no screw in the hole shown for the main PC board.

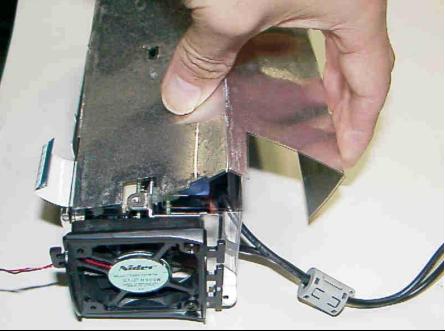
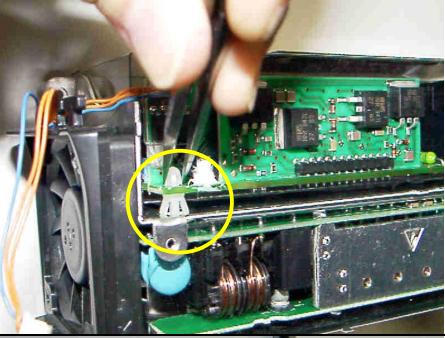
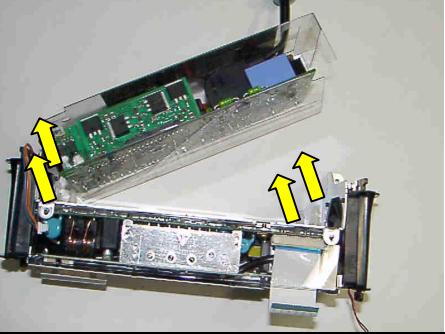
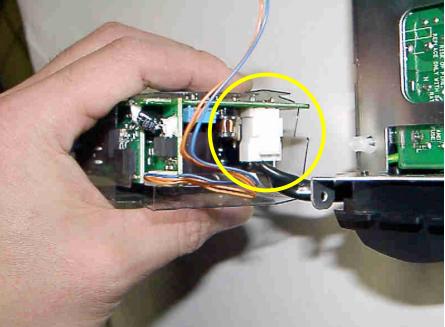
### 3-4. Lamp Housing and Exhaust Fan

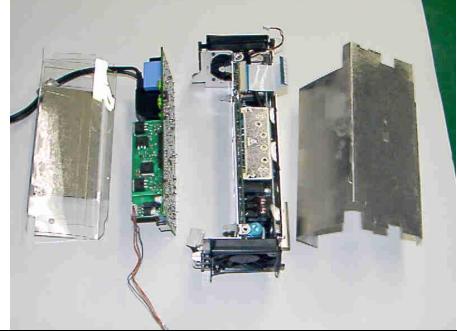
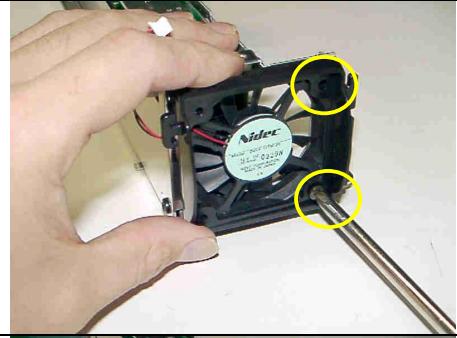
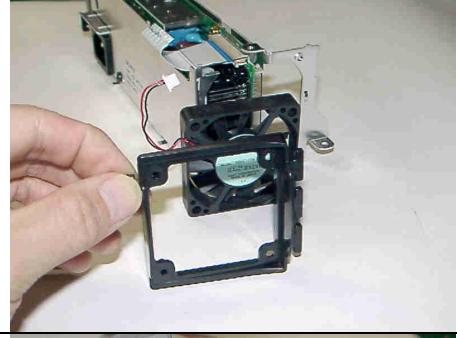
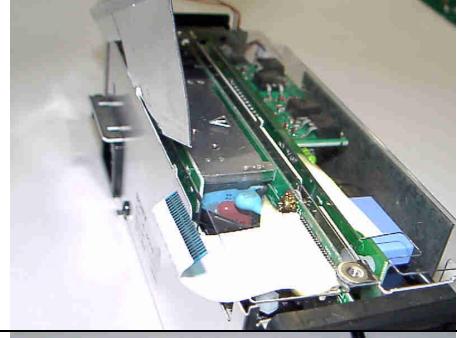
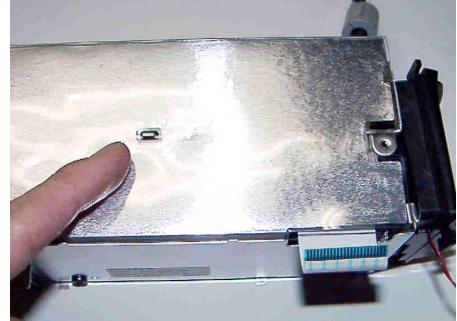
Step	Figure	Explanation
1		<p>Remove two screws that secure the lamp connector (M2.6 x 6). Screw : type [M-1]</p> 
2		Pull connector upward to remove.
3		<p>Remove three screws that secure the lamp housing and fan to the cabinet (M2.6 x 6). Screw : type [M-3]</p>  <p>Remove one screw that secures the lamp housing to the optical engine (M2.6 x 6). (Green marked) Screw : type [M-1]</p> 
4		Pull up the lamp housing upward.
5		The lamp housing and exhaust fan are removed together.

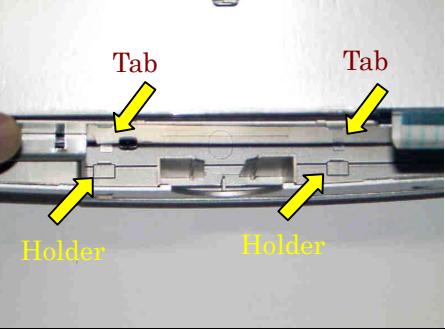
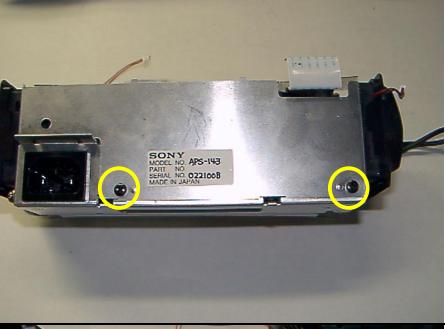
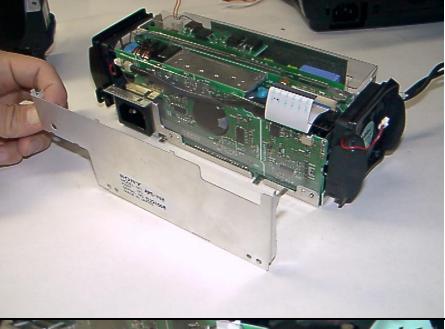
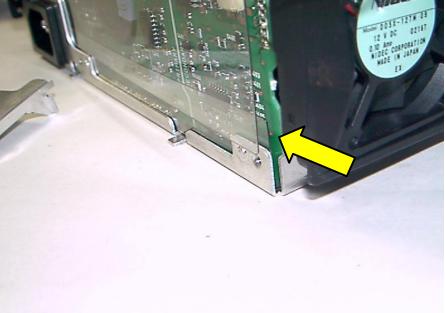
6		The exhaust fan module slides upward
7		[Note] The exhaust fan module is fixed in the rail.
8		[Note] Separate the fan module from the lamp housing.
9		Remove two screws (M3 x 20).  Screw : type [M-6] 
10		Fan holder and the exhaust fan are separated.

### 3-5. Power Supply Unit and Lamp Driver Unit

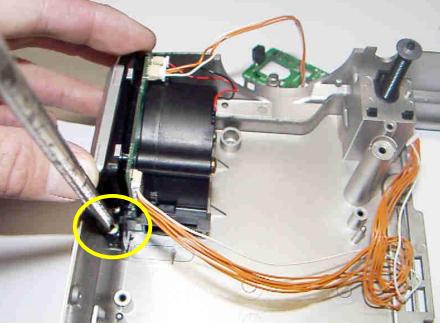
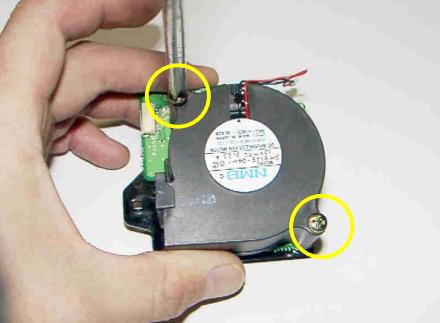
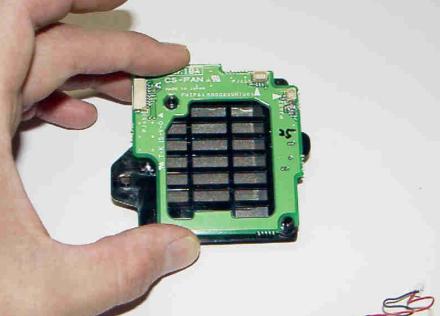
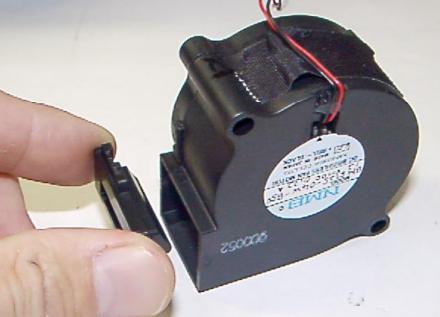
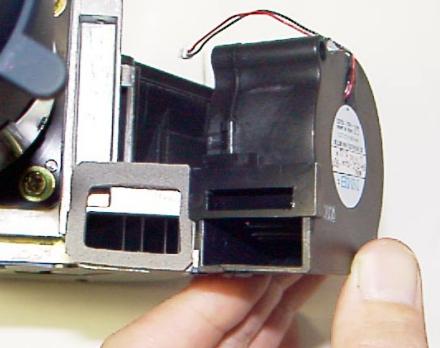
Step	Figure	Explanation
1		Cut the cable tie with wire cutters.
2		Loosen the cable clamp.
3		Remove this screw (M2.6 x 6). Screw : type [M-3] 
4		Remove this screw (M2.6 x 6). Screw : type [M-3] 
5		Slide the power supply unit toward the front and lift up. [Note] The power supply unit has two tabs at the bottom.

6		Remove the EMC shield cover.
7		The EMC shield cover is wrapped around the power supply unit.
8		Release four PC mounts by using tweezers.
9		Power supply unit and lamp driver are separated.
10		Remove the connector, which connects lamp driver with power supply unit.

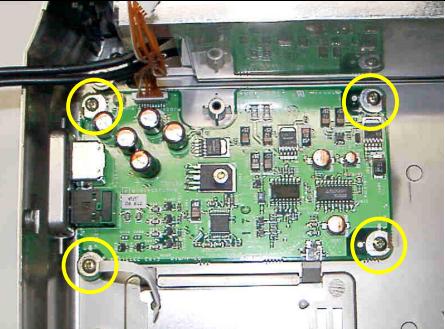
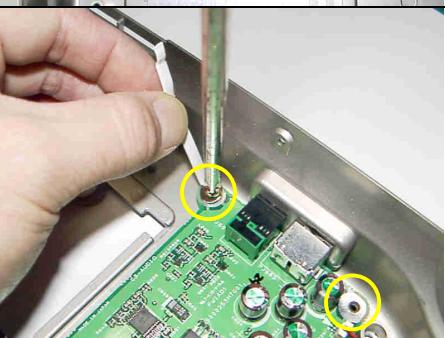
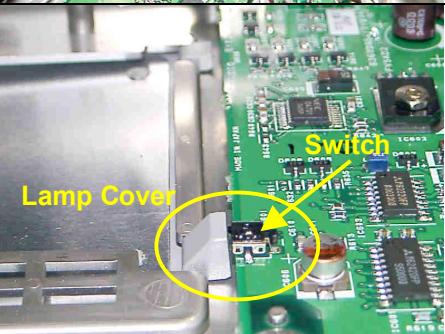
11		
12		<p>Remove two screws (M3 x 14).  Screw : type [M-7]</p> 
13		
14		<p>[Note]  Insert shield case in the clearance between the unit and aluminum case.</p>
15		<p>[Note]  Align the tab of the aluminum case in the hole of the shield case.</p>

16		<p>[Note] Insert the tabs from the power unit into the holder of the cabinet.</p>
17		<p>Remove two screws.</p>
18		<p>Remove aluminum plate.</p>
19		<p>Be careful to lay an insulation seat.</p>

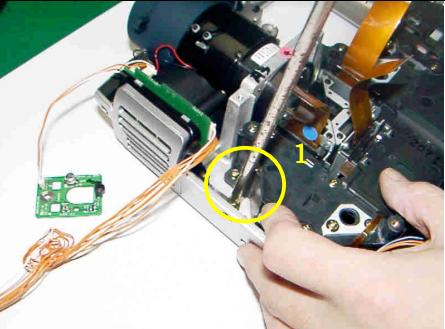
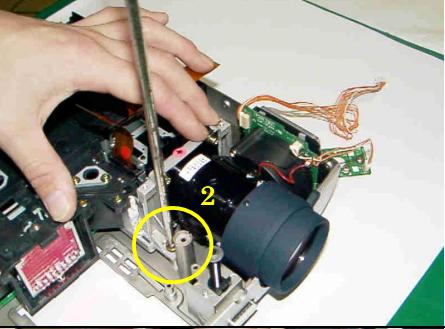
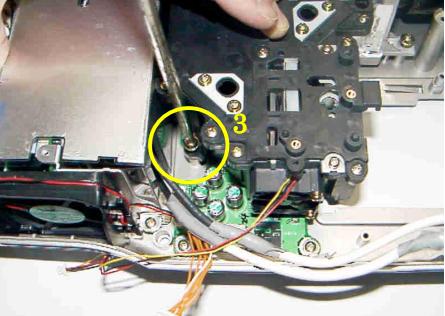
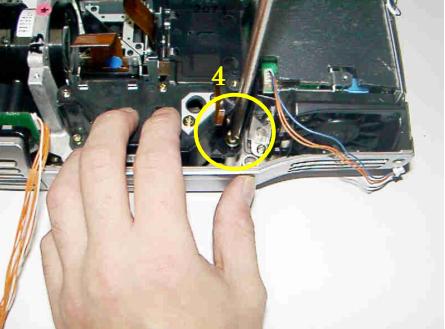
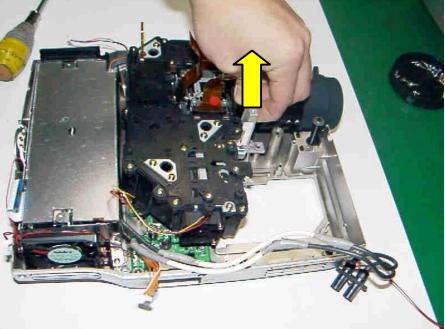
### 3-6. Intake Fan

Step	Figure	Explanation
1		<p>Remove the screw that mounts the fan to the cabinet (M2.6 x 6).</p> <p>Screw : type [M-3]</p> 
2		<p>Remove two screws (M3 x 30).</p> <p>Screw : type [M-8]</p> 
3		<p>The fan PC board is between the intake fan and the dust filter holder.</p>
4	 	<p>Install intake fan air guide adapter, so air will not leak from the sub frame assembly.</p>

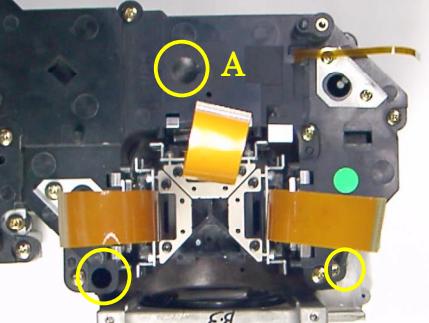
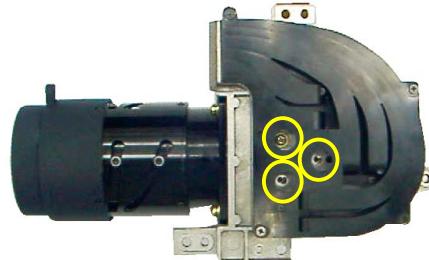
### 3-7. Audio PC Board

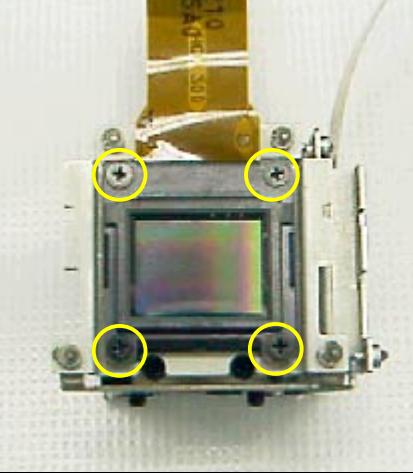
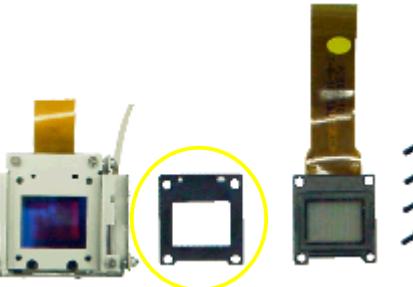
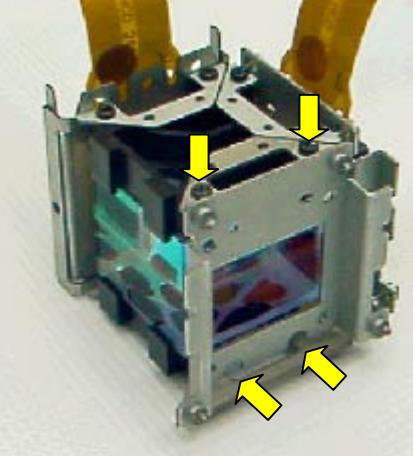
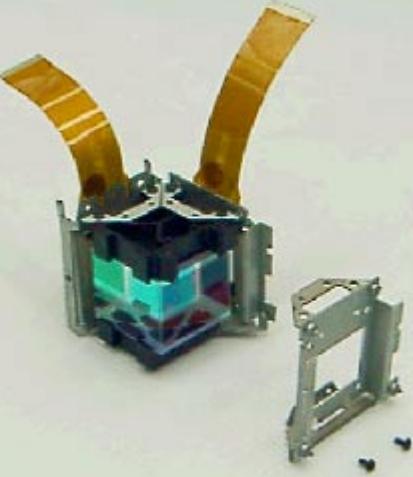
Step	Figure	Explanation
1		<p>Remove four screws to remove the audio PC board (M2.6 x 6).</p> <p>Screw : type [M-3]</p> 
2		<p>[Note] Place the two cable clamp on the connector side.</p>
3		<p>[Note] The safety interlock switch is pushed when the lamp cover is replaced.</p>

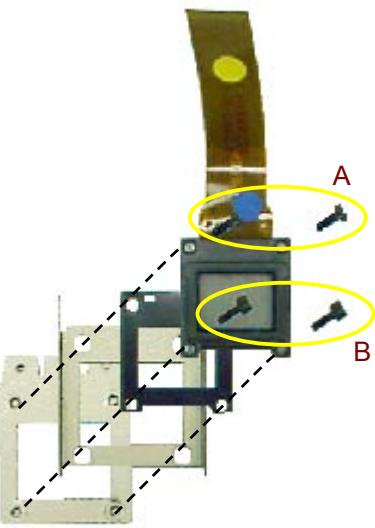
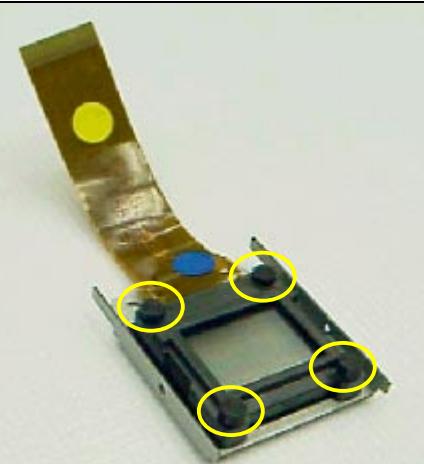
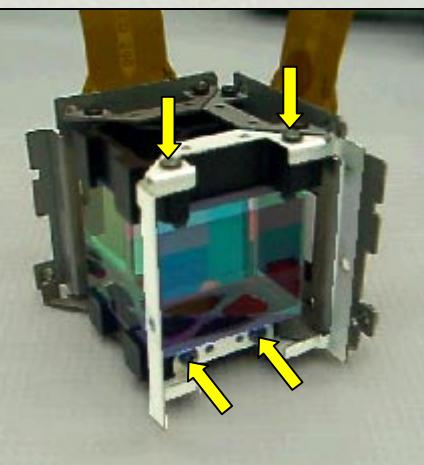
### 3-8. Optical Engine

Step	Figure	Explanation
1		<p>Remove four screws labeled 1 through 4 to remove the optical engine (M4 x 13).</p> <p>Screw : type [M-5]</p> 
2		#2 is near the lens.
3		#3 is near the power supply on the right side of the unit.
4		#4 is near the power supply on the left side of the unit.
5		<p>Place the unit where it is shown in the photograph, and pull the optical engine up.</p> <p>[Note] Be careful not to touch the projection lens.</p>

### 3-9. LCD PANEL

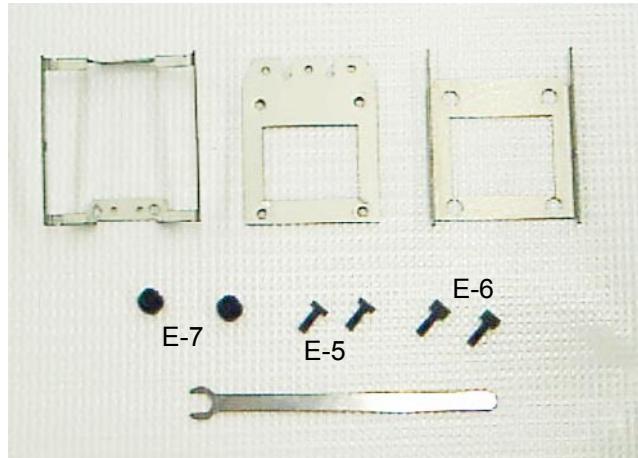
Step	Figure	Explanation
1		<p>Remove three screws (M3 x 6). Screw : type [E-1]</p>  <p>[Note] Tear off adhesive tape when you remove the screw of A.</p>
2		Separate main frame and sub frame.
3		<p>Remove three screws (M2.5 x 8). Screw : type [E-2]</p> 
4		Separate prism block from main frame.

5		<p>Remove four screws (M2.6 x 6).</p> <p>Screw : type [E-3]</p> 
6		<p>Separate the LCD panel and the mask and the bracket</p> <p>[Note] Leave the mask because it is used again. (yellow marked)</p> <p>The LCD Panel and four screws are not used.</p>
7		<p>Remove four screws (M2 x 4).</p> <p>Screw : type [E-4]</p> 
8		<p>[Note] The removed bracket isn't used again.</p>

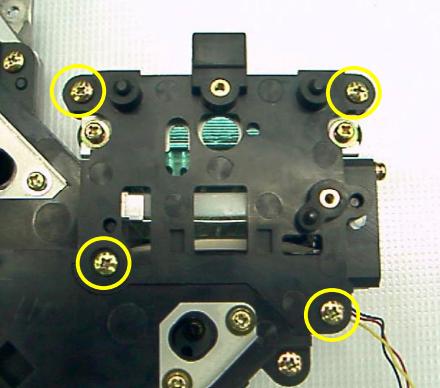
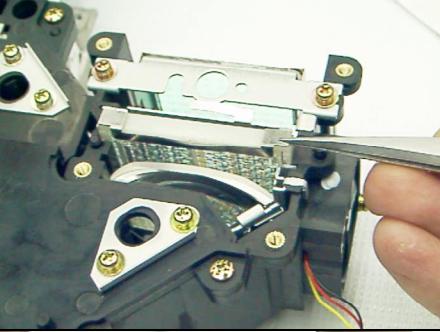
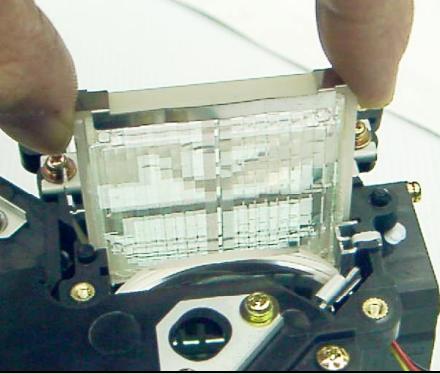
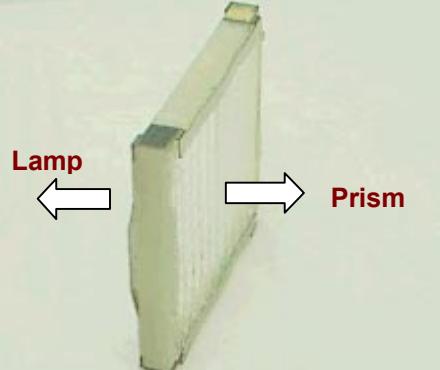
		<p>LCD PANEL HOLDER MODULE ASSEMBLY</p> <p>Install a new panel with four screws.</p> <p>[Note] There are two kinds of types of the screw.</p> <p>A Side Screw : type [E-5]</p>  <p>B Side Screw : type [E-6]</p> 
9		<p>Four screws are to do temporary tightening.</p>
10		<p>Tighten a new bracket with four screws (M2 x 4).</p> <p>Screw : type [E-4]</p>  <p>[Note] Four screws are tighten an old bracket.</p>

12		Install the LCD panel holder module made by step 9.
13		Fix the LCD panel holder module on the bracket with two screws (M2x2).  Screw : type [ E-7] 
14		Fix a prism block on the main frame.

[Note] Panel holder service kit ( E205S : 23430870 )



### 3-10. MULTI-PBS (Polarizing Beam Splitter)

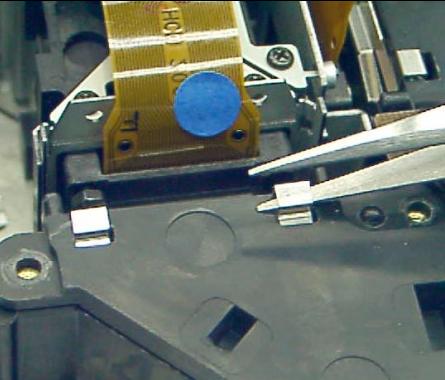
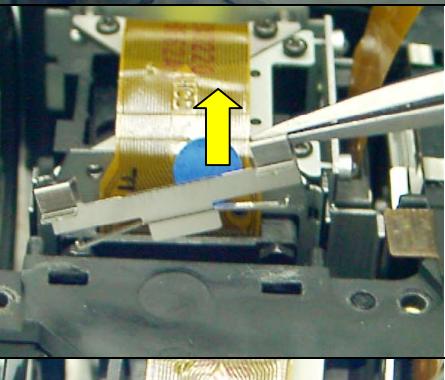
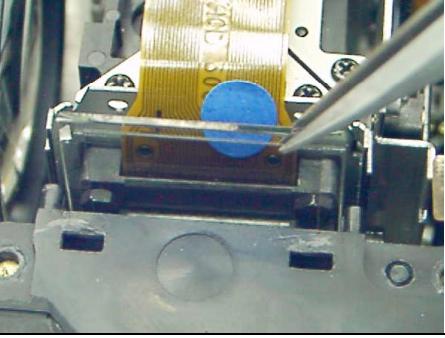
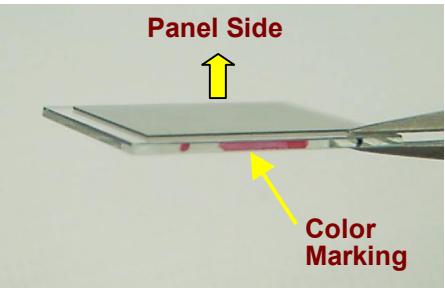
Step	Figure	Explanation
1		<p>Remove four screws (M2.5 x 6) .</p> <p>Screw : type [E-8]</p> 
2		Lift the Multi-PBS with tweezers a little.
3		Remove the Multi-PBS.
4		<p>[Note]</p> <p>Be careful in the direction which it is installed in.</p>

5		Insert the Multi-PBS.
6		Put a metal fitting in the gap.

### 3-11. Optical Engine Cooling FAN

1		Remove four screws (M2.5 x 16). Screw : type [E-9]
---	--	---

### 3-12. Polarized Plate

Step	Figure	Explanation
1		Lift a stopper by using the tweezers.
2		Remove a stopper.
3		Remove a polarized plate.
4		<p>[Note]          Be careful in the direction which it is installed in.          Be careful of the color, color have to match with LCD panel.</p>

### 3-13. Screws for Mechanical Parts

TYPE	FORM	SIZE	LOCATION
M-1		2.6 x 6	Main PCB(5), Lamp house(1), Lamp cable connector(1), Top cover(8), Lamp cover(2)
M-2		2 x 4	Front cover(2)
M-3		2.6 x 6	Audio PCB(4), Rem PCB(1), Intake FAN module(1), Lamp house(1), Exhaust FAN module(2)
M-4		3 x 8	Thermo-sensor(1), Wire holder(1)
M-5		3 x 12	Optical Engine(4)
M-6		3 x 20	Exhaust FAN(2)
M-7		3 x 14	Power FAN(2)
M-8		3 x 30	Intake FAN(2)

### 3-14. Screws for Optical Engine

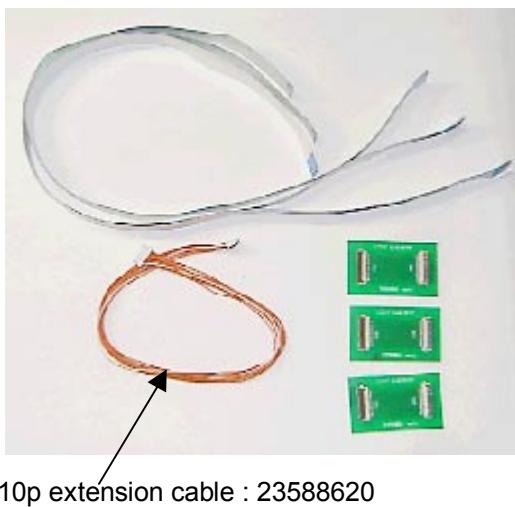
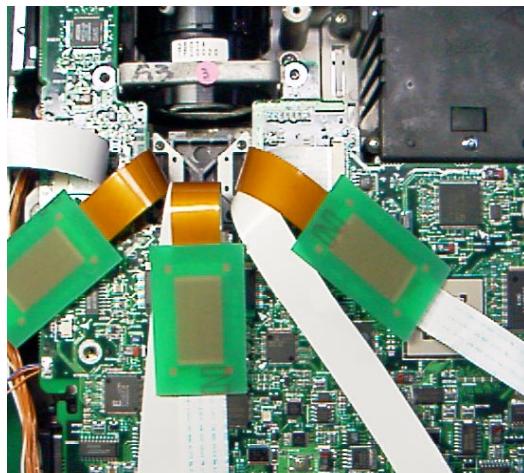
TYPE	FORM	SIZE	LOCATION
E-1		M3 x 6	Prism and Main Frame (3)
E-2		M2.5 x 8	Main Frame and Sub Frame (3)
E-3		M2.5 x 6	LCD PANEL (4) * Not used after remove old panel
E-4		M2 x 4	Bracket (4)
E-5		M2.5 x 6	LCD Panel (connector side) (2) *Contained in Panel Service Kits
E-6		M2.5 x 6	LCD Panel (2) *Contained in Panel Service Kits
E-7		M2 x 2	LCD Panel Bracket (2) *Contained in Panel Service Kits
E-8		M2.5 x 6	Multi-PBS Cover (4)
E-9		M2.5 x 16	PBS Cooling FAN (2)

## 4. OPTICAL ADJUSTMENT

### 4-1. PREPARATION

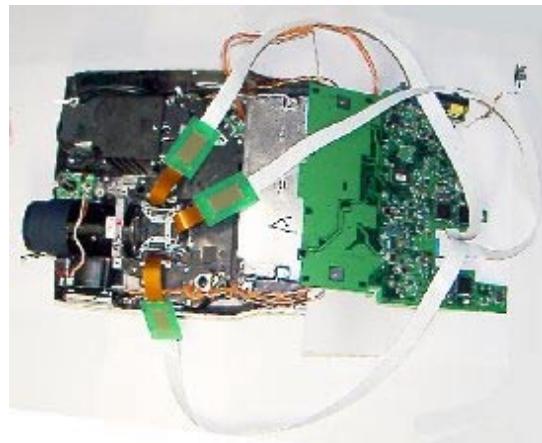
#### < Test Equipments and Test Jigs >

- Personal computer (Windows P/C,  
OS:windows95/98)
- Adjustment software SINGO98.EXE
- RGB cable
- A precise screwdriver (minus)
- Hexagon Wrench (include service kit)
- Extension cable  
(Flat cable)  
Include the Service Kit for TLP65 series  
M100S : 23588552  
(10p cable)  
M005S:23588620



#### (4) Lift up a Main PC Board.

Be careful not to touch circuit and cabinet.



#### (1) Setting

Put PJ on the horizontal place, and project it on the vertical screen.

#### (2) Disconnect the following connectors

- Disconnect PJ851,PJ901,PJ951,PJ990
- Disconnect PJ1
- Remove Thermo Switch (P100) form lamp housing.

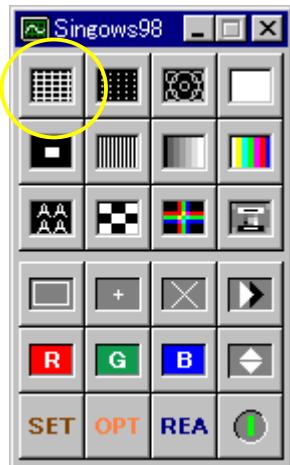
#### (3) Connect extension cable

- Connect PJ851 and R-Panel with extension cable.
- Connect PJ901 and G-Panel with extension cable.
- Connect PJ951 and B-Panel with extension cable.
- Connect PJ1 and PJ604(AUDIO) with extension cable.

[Note] PJ990 is N.C.

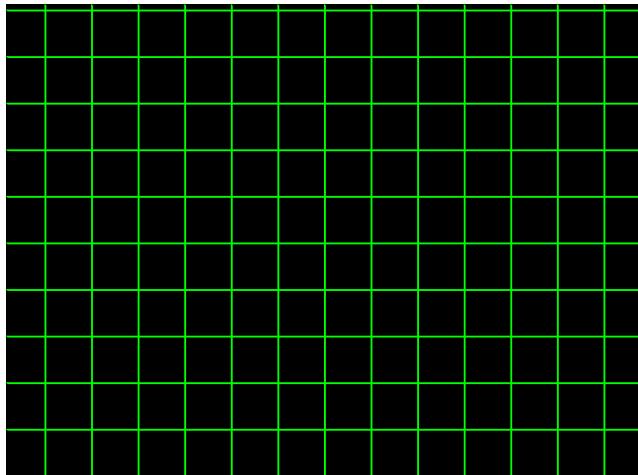
#### (4) Test Pattern Set-up

Connect a computer with RGB cable, and start the Pattern generating software (SINGO98.exe).

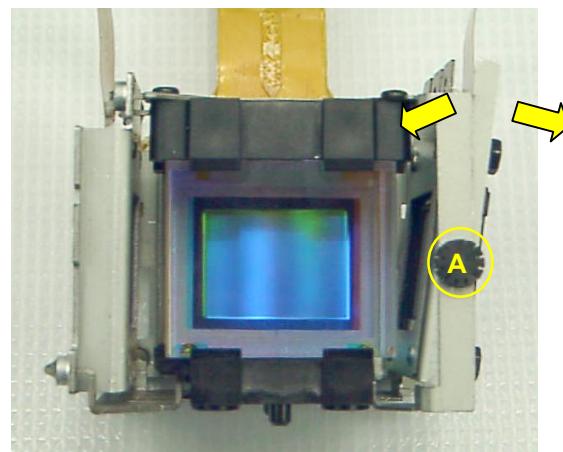


Click cross hatch button.

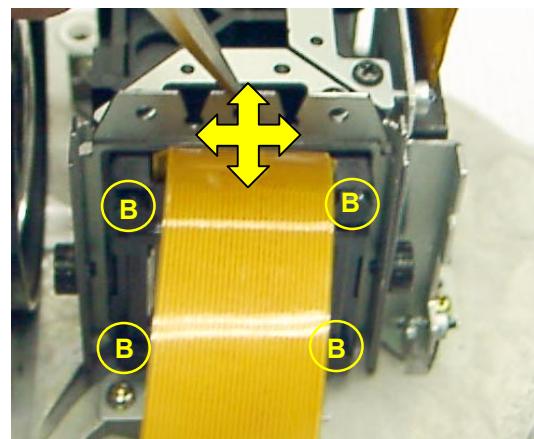
Click [R] and [B] button to display G-Cross Hatch.



#### (5) Focus Adjustment

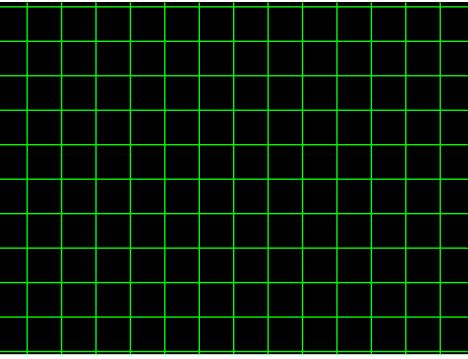
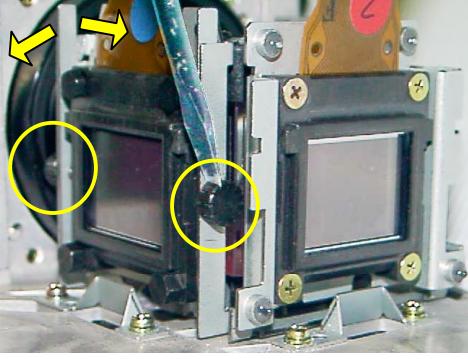
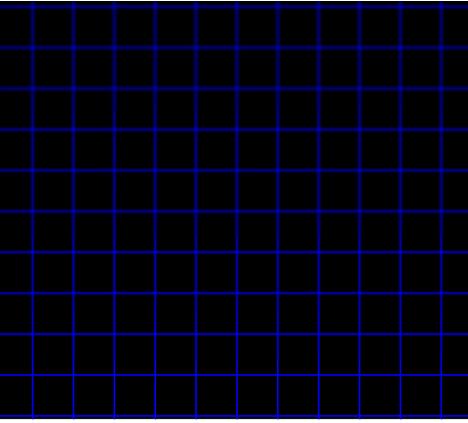
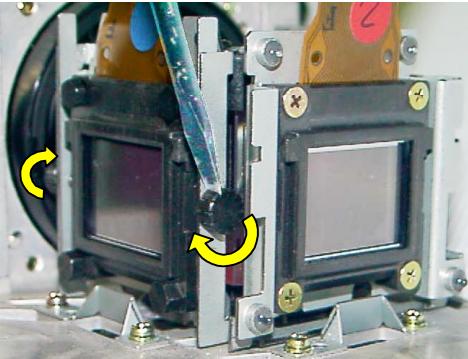


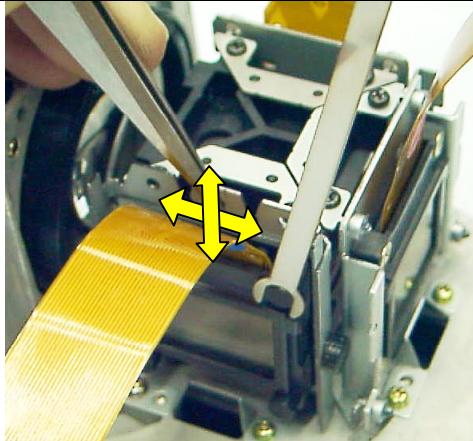
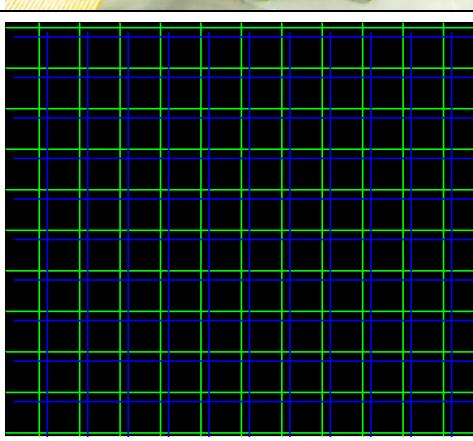
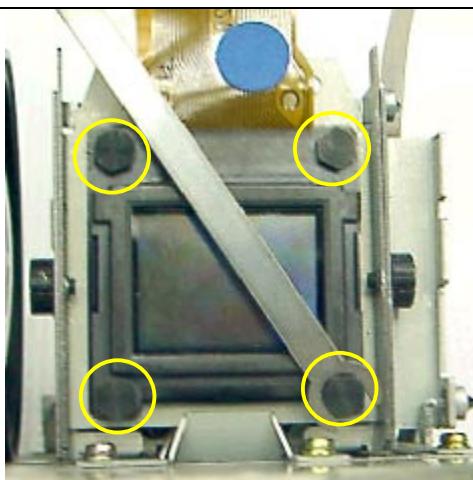
When a screw (A) is loosened, the panel moves to front and back, and focus can be adjusted.



When the screws (B) are loosened, the panel moves to left,right,up and down, and convergence can be adjusted.

## 4-2. Adjustment of Focus (ex. Blue panel exchange)

Step	Figure	Explanation
1		TEST PATTERN : Green Cross Hatch Adjust focus by projection Lens.
2		TEST PATTERN : Blue Cross Hatch Move a panel in front and back, and adjust a focus. Tighten two screws little by little.
3		
4		Tighten two screws, when you reached best focus point.

5		<p>TEST PATTERN : Blue and Green Cross Hatch Move a panel in left, right, up and down, and adjust a convergence.</p>
6		
7		<p>Tighten four screws.</p>

## 5. ELECTRICAL ADJUSTMENT

### 5-1. PREPARATION

#### < Test Equipment and Jigs >

- Oscilloscope
- Digital voltmeter
- Adjustment software TLPB2S.EXE
- Personal computer
- Signal generator

#### < Connection and Setting of Personal Computer >

##### (1) Connection of personal computer

Connect a computer as shown in following Fig. 1-4-1, then perform the adjustment using the adjustment software TLPB2S.EXE

Use the supplied serial cable for connection.

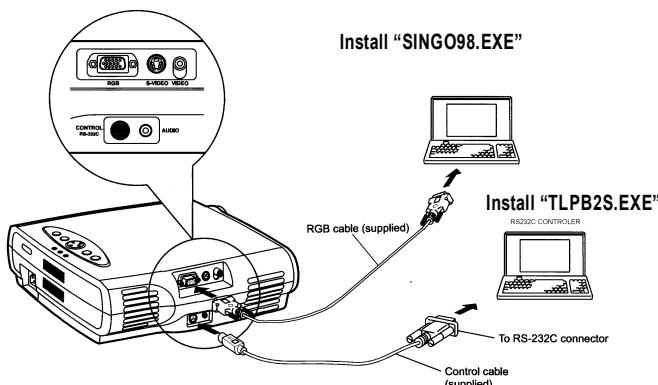


Fig. 1-4-1

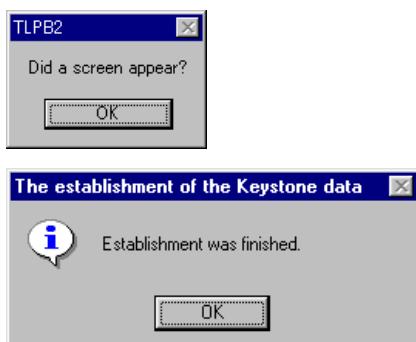


Fig. 1-4-3

#### (2) Adjustment software

Electrical adjustment is carried out using the adjustment software. When the software is started, a screen like the following image (Fig. 1-4-2) appears.



Fig. 1-4-2

##### [Shading Compensation]

→ When a Main PC board will be replaced.

Before replacing, download the current data from PJ. After replacing, upload the current data to new PCB.

##### [Electrical Adjustment]

→ When the LCD panels or the Main PC board are replaced.

##### [Error List]

→ When the error code which occurred by now is examined.

##### [Software Upgrade ]

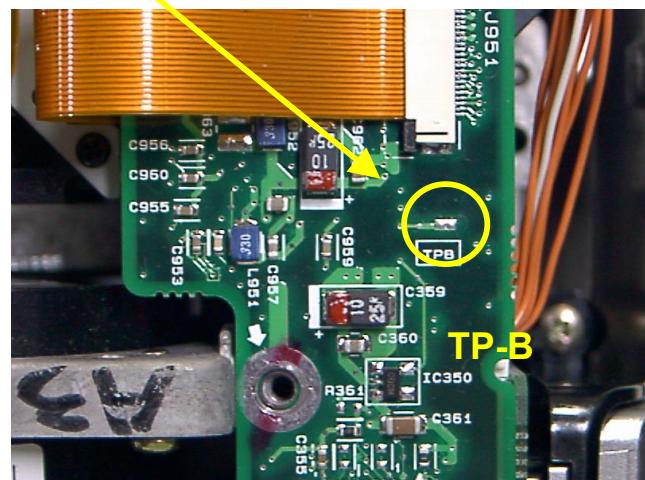
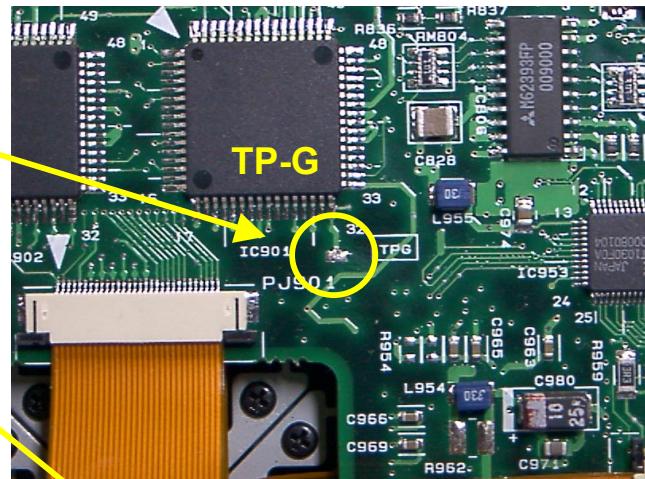
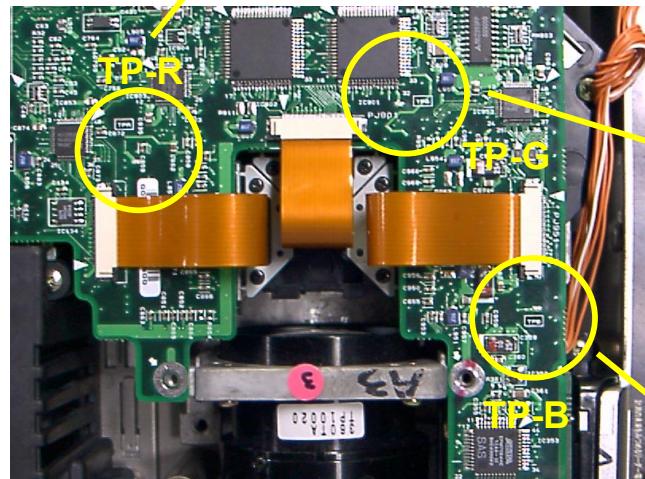
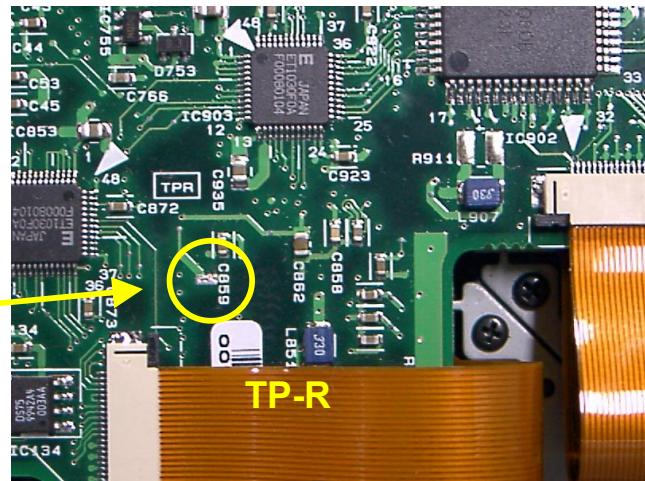
→ When you upgrade the software.

##### (Note)

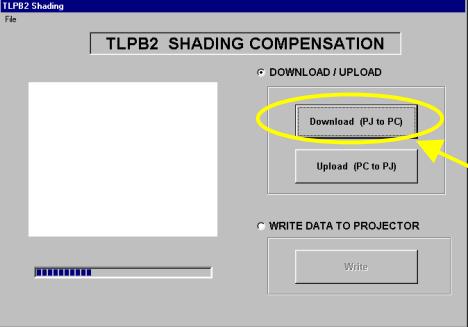
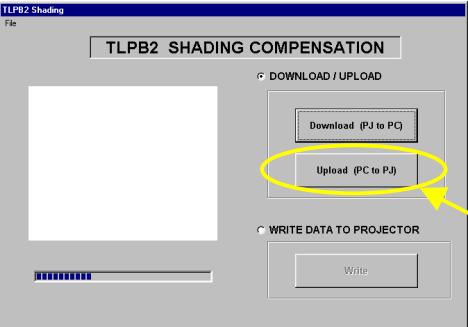
Electrical adjustment menu changes automatically by pressing [next] button with every step. This software transmits the necessary command automatically.

If the message box (Fig.1-4-3) appears in the middle of an adjustment, push the [OK] button after confirming .

**(3) TEST POINTS**

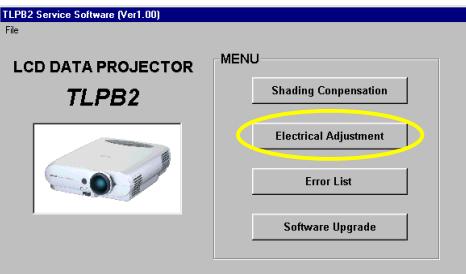
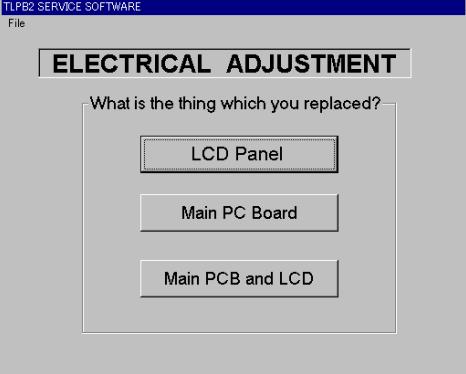


## 5-2. SHADING COMPENSATION (When the Main PC board will be replaced.)

Step	Figure	Explanation
1		Press the [Shading Compensation] button.
2		<p>Press [Download] button.</p> <p>The current shading data will be read from projector and be saved this data to Personal Computer.</p>
3		<p>After replacing the Main PC Board, press [Upload] button.</p> <p>The shading data (in the old PCB) will be written to the projector.</p>

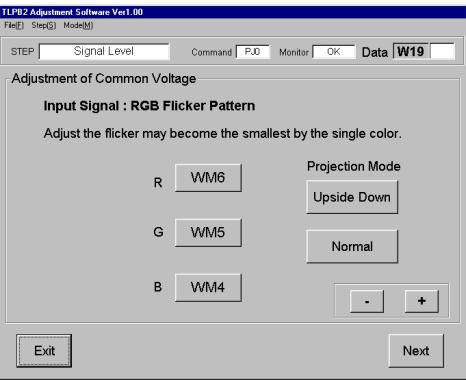
### 5-3. ELECTRICAL ADJUSTMENT

(When the Main PC board or the LCD panels are replaced.)

Step	Figure	Explanation
1		Press the [Electrical Adjustment] button.
2		<p>Choose the menu which is suitable for parts replaced.</p> <p>(A) When you changed the LCD panel only, then select the [LCD Panel] button. (→ 5-3-1 )</p> <p>(B) When you changed the Main PC Board only, then select the [Main PC Board] button. (→ 5-3-2 )</p> <p>(C) When you changed the Main PC Board and LCD Panels, then select the [Main PCB and LCD] button. (→ 5-3-2 )</p>

#### 5-3-1. When a panel was replaced.

##### 5-3-1-1. Flicker Adjustment

Step	Figure	Explanation
1		<p><b>Input Signal : RGB flicker pattern</b></p> <p>(1) Select a red single color screen when adjusting R. Click the [WM6] button, and adjust the flicker level to minimum in both [+] and [-] directions, taking note of the data values. Then set data to the mid-point between the two previously noted values</p> <p>(2) Adjust other colors to be the same, using [WM5] for green and [WM4] for blue.</p> <p>(3) Click the [Upside Down] button to change projection mode.</p> <p>(4) Adjust this mode in the same way.</p> <p>(5) Click [Next] buttons.</p> <p style="text-align: right;"><b>Recommendation value : 40 – 50</b></p>

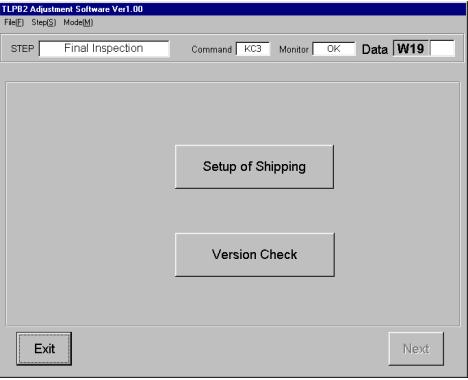
### 5-3-1-2. Shading Compensation

<p>1</p>	<p>(1) Move scroll bar, and choose the similar pattern which being projected from the projector.</p> <p>(2) Press [Write] button, then it will be written the selected data to the projector.</p> <p>(3) After writing shading data (when a progress bar is disappeared), press [Next] button.</p>
<p>2</p> <p>Press [Next] button</p>	<p>(1) Press [Next] button.</p>

### 5-3-1-3. Adjustment of Color Temperature

<p>1</p>	<p><b>Input Signal : 50%, RGB white</b></p> <p>(1) Click [W03] and/or [W05] buttons, and adjust screen to be natural gray.</p> <p>(2) Click [Next] button.</p>
<p>2</p>	<p><b>Input Signal : 50%, Video white</b></p> <p>1) Click [W03] and/or [W05] buttons, and adjust screen to be natural gray.</p> <p>2) Click [Next] button.</p>

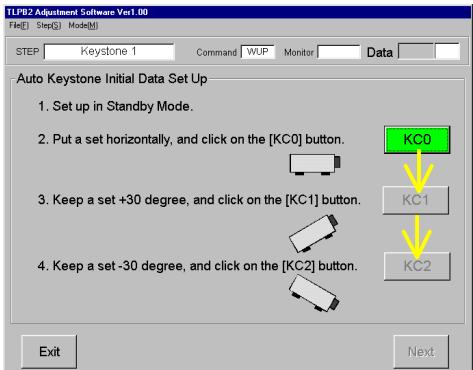
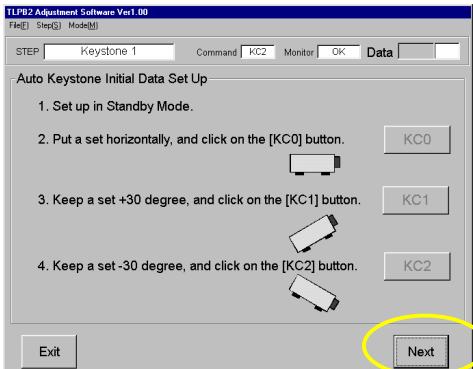
### 5-3-1-4. Final Inspection

1		<p>(1) Click the [Setup of Shipping] button, and set the default.</p> <p>[Note] If you click the [Setup of Shipping], then “Total working time”, “Lamp timer” and “User memory” are initialized.</p> <p>(2) Click the [Version Check] button, and check the “Software version” and “Total working time”.</p>
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## 5-3-2. When a Main PCB was replaced.

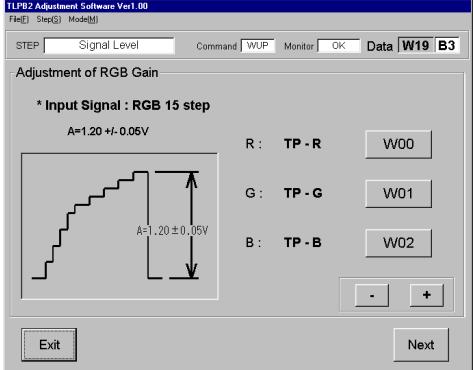
(Same as Main PCB and LCD are replaced)

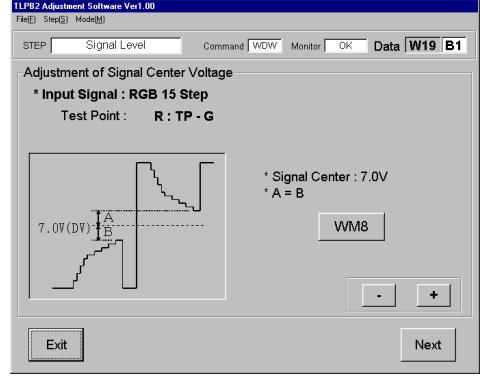
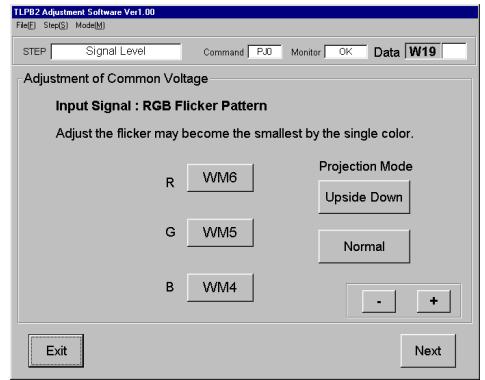
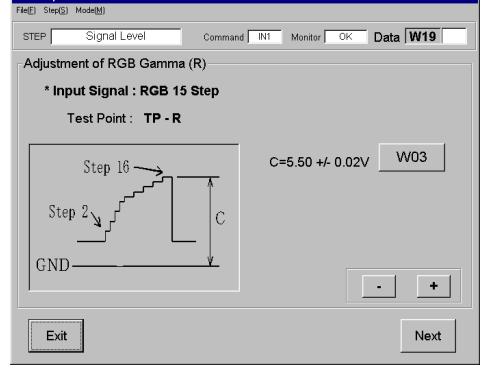
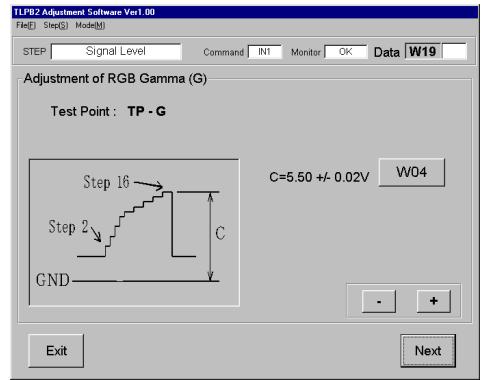
### 5-3-2-1. Compensation of Keystone data (at low temperature)

1		<p><b>Input Signal : RGB 15 step signal</b></p> <p>(1) Set the projector horizontally, and click the [KC0] button.</p> <p>(2) Set the projector to a +30 degree angle, and click the [KC1] button.</p> <p>(3) Set the projector to a -30 degree angle, and click the [KC2] button</p> <p>[Note]</p> <p>* A green button is available.</p>
2		<p>(1) Press [Next] button.</p> <p>[Note]</p> <p>* When the measurement of three statuses are completed, [Next] button will be available.</p> <p>* These three measured data are used for the compensation of the gravity sensor.</p>

### 5-3-2-2. Adjustment of Input Signal Level

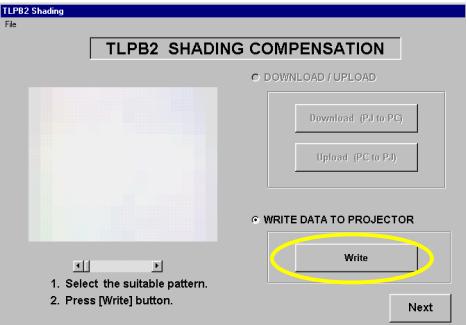
[Note] TEST POINT (TP-R/TP-G/TP-B) , refer to page 1-29

1		<p><b>Input Signal : RGB 15 step signal</b></p> <p>(1) Monitor the waveform at the respective test point ("TP-R" when you adjust the R level).</p> <p>(2) When the [W00] button is clicked, you enter the "R" adjustment mode.</p> <p>(3) Click the [+] or [-] button to adjust the signal level.</p> <p>(4) Adjust "G" and "B" colors to be the same.</p> <p>(5) Click the [Next] button to proceed to the next adjustment.</p>
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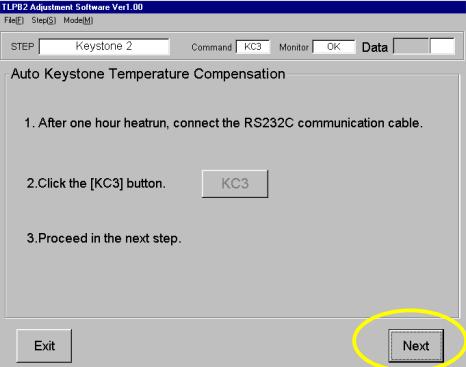
2		<p>(1) Monitor the waveform at the test point "TP-G".  (2) Click the [WMB] button and adjust to the specified level.  (3) Check the voltage at the test points "TP-R" and "TP-B".  (4) Click [Next] button.</p> <p><b>[Note]</b>  "G" and "B" levels also change when the [WMB] adjustment is performed.</p> <p><b>Recommendation value : E8 (min:E0 – max:F5)</b></p>
3		<p><b>Input Signal : RGB flicker pattern</b>  (1) Select a red single color screen when adjusting R. Click the [WM6] button, and adjust the flicker level to minimum in both + and - directions, taking note of the data values. Then set data to the mid-point between the two previously noted values.  (2) Adjust other colors to be the same, using [WM5] for green and [WM4] for blue.  (3) Click the [Upside Down] button to change projection mode.  (4) Adjust this mode in the same way.  (5) Click [Next] buttons.</p> <p><b>Recommendation value : 40 – 50</b></p>
4		<p>(1) Monitor the waveform at test point "TP-R".  (2) Click the [W03] button and adjust to the specified level.  (3) Click [Next] button.</p> <p><b>[Note]</b>  A signal level rises when [-] is pushed.  A signal level falls down when [+] is pushed.</p>
5		<p>(1) Monitor the waveform at test point "TP-G".  (2) Click the [W04] button and adjust to the specified level.  (3) Click [Next] button.</p>

6		<p>(1) Monitor the waveform at test point "TP - B".</p> <p>(2) Click the [W05] button and adjust to the specified level.</p> <p>(3) Click [Next] button.</p>
7		<p>[Note] When you select this adjustment, the software will force video input mode. Please ensure that you have a video pattern generator connected.</p> <p>(1) Monitor the waveform at test point "TP - R".</p> <p>(2) Click the [W03] button and adjust to the specified level.</p> <p>(3) Click [Next] button.</p>
8		<p>(1) Monitor the waveform at test point "TP - G".</p> <p>(2) Click the [W04] button and adjust to the specified level.</p> <p>(3) Click [Next] button.</p>
9		<p>(1) Monitor the waveform at test point "TP - B".</p> <p>(2) Click the [W05] button and adjust to the specified level.</p> <p>(3) Click [Next] button.</p>

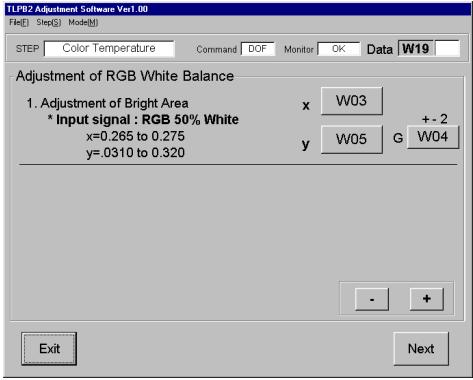
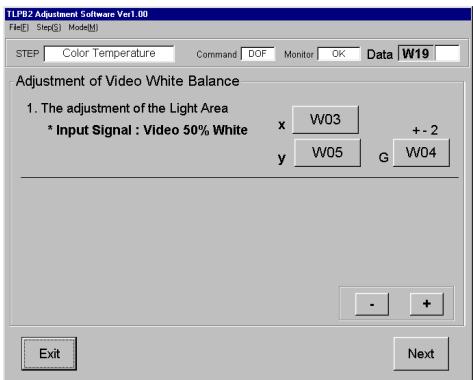
### 5-3-2-3. Shading Compensation

 <p>1 1. Select the suitable pattern. 2. Press [Write] button.</p>	<p>(1) Choose the similar pattern which being projected from the projector.</p> <p>(2) Press [Write] button, then it will be written the selected data to the projector.</p> <p>(3) After writing shading data (when a progress bar is disappeared), press [Next] button.</p>
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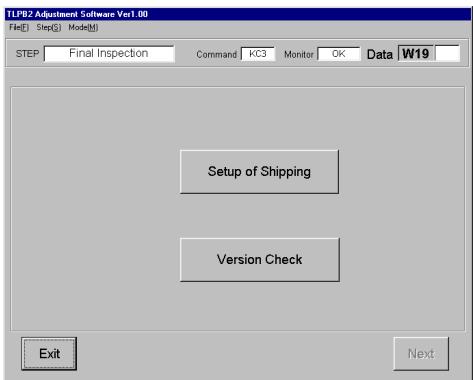
### 5-3-2-4. Compensation of Keystone Data (after heat run)

 <p>1 1. After one hour heatrun, connect the RS232C communication cable. 2.Click the [KC3] button. 3.Proceed in the next step.</p>	<p>(1) Set the projector horizontally, and click the [KC3] button.</p> <p>[Note] The deviation of the inclination sensor due to rise in temperature is corrected by measuring after warming up for approximately one hour.</p>
 <p>2 1. After one hour heatrun, connect the RS232C communication cable. 2.Click the [KC3] button. 3.Proceed in the next step.</p>	<p>(1) Press [Next] button.</p>

### 5-3-2-5. Adjustment of Color Temperature

 <p>1</p>	<p><b>Input Signal : RGB 50% White</b></p> <p>(1) Click [W03] and/or [W05] buttons, and adjust screen until it becomes a natural gray.</p> <p>(2) Click [Next] button.</p>
 <p>2</p>	<p><b>Input Signal : RGB 50% White</b></p> <p>(1) Click [W03] and/or [W05] buttons, and adjust screen until it becomes a natural gray.</p> <p>(2) Click [Next] button.</p>

### 5-3-2-6. Final Inspection

 <p>1</p>	<p>(1) Click the [Setup of Shipping] button, and set the default.</p> <p>[Note] If you click the [Setup of Shipping], then “Total working Time”, “Lamp timer” and “User memory” are initialized.</p> <p>(2) Click the [Version Check] button, and check the “Software version” and “Total working time”.</p>
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# SECTION2

## SERVICING DIAGRAMS

### 1. TROUBLE SHOOTING

CAUSE	CHECK POINT	CHEK ITEM	JUDGE
Power is not on	Flat cable of Power supply (disconnect PJ401)	Standby voltage (See page 2-3)	(NG) → Power supply is NG.  (OK) → Check next step.
	PJ401 (connect PJ401)	Standby voltage	(NG) → Main PCB is NG, or any cable connection is NG.
Power off during use	LED Display	Lighting pattern	See 2-4
Lamp is not on	Lamp	Fractured or not	(Fractured) → Change new lamp.  (Not Fractured) → Check Lamp cover or PJ3.
No image	No Signal on screen display	Indicated or not	(Indicated) → RGB/Video terminal is NG, or Main PCB is NG.  (Not Indicated) → Check next step.
	Test Point TP-R TP-G TP-B	Signal shape	(Correct) → LCD panel is NG, or PJ851/PJ901/PJ951 is NG.  (Incorrect) → Main PCB is NG.

#### ATTENTION

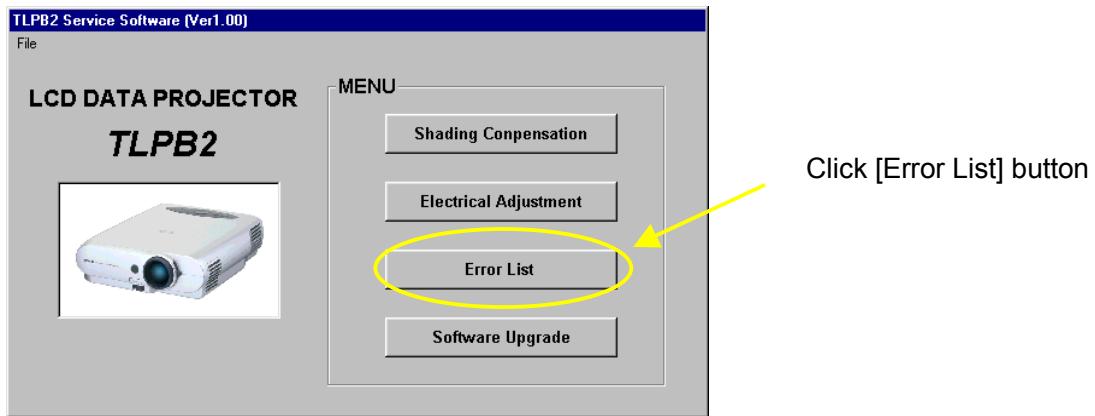
LED displays various error pattern. (See 2-4)

Be careful because the same error occurs in the miss contact of the cable as well.

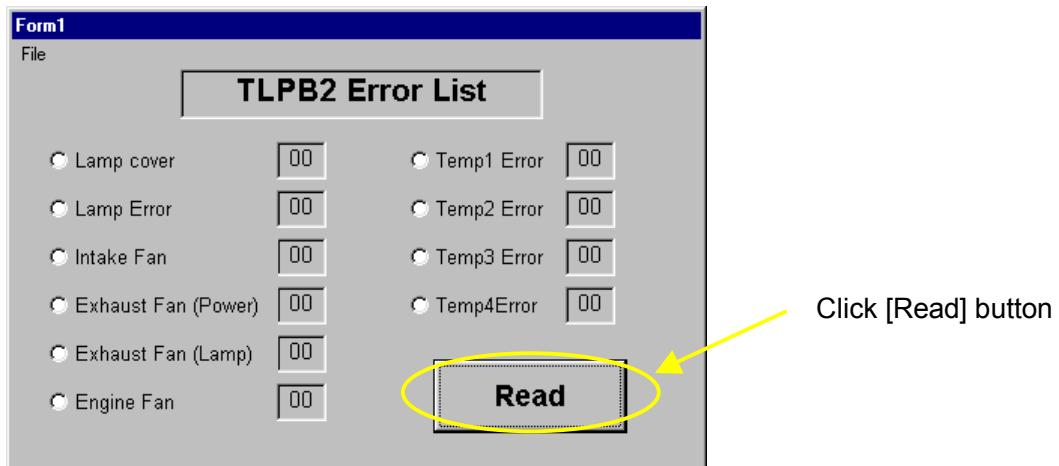
LED error combination display always show the latest error.

## USAGE of SERVICE SOFTWARE

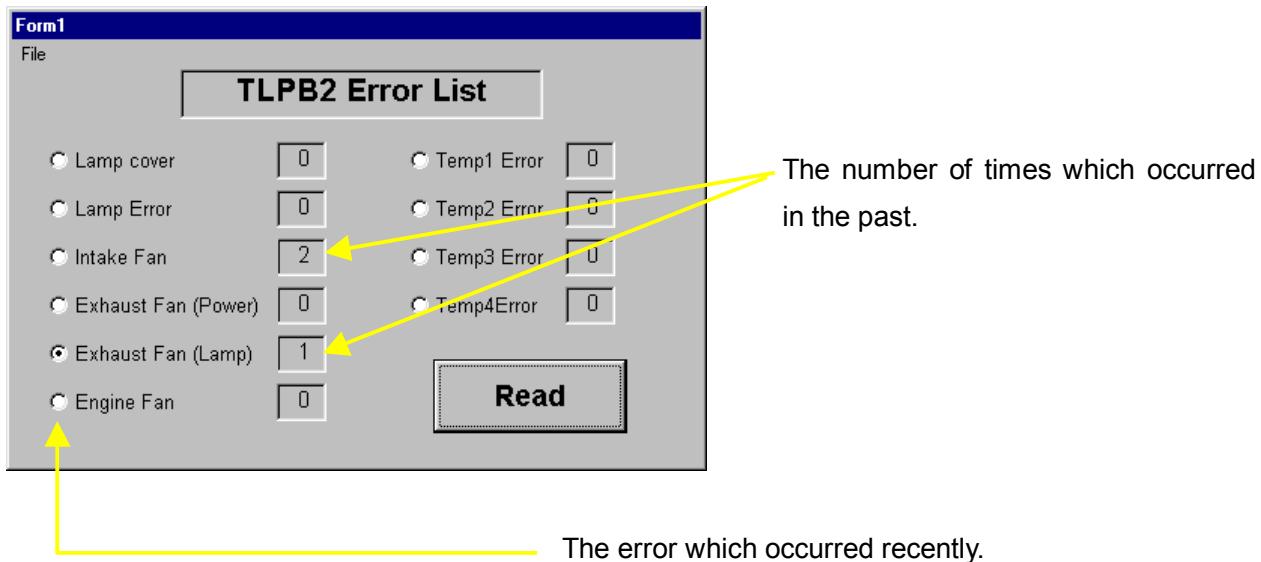
(1) Start service software(TLPB2S.EXE).



(2) Reading of the error list.



(3) The point of view of the indication.



## 2. CONNECTOR PIN ASSIGNMENT

**PJ1 (MAIN) ↔ PJ604 (AUDIO)**

1	STANDBY_13V	+13V (AUDIO)
2	GND	0V
3	STANDBY_6V	+6V
4	GND	0V
5	I <sup>2</sup> C_SDA (5V)	0V to +5V (Pulse)
6	I <sup>2</sup> C_SCL (5V)	0V to +5V (Pulse)
7	RS232C_TXD	±7V
8	RS232C_RXD	±7V
9	Audio Power	ON(+5V)/OFF(0V)
10	GND	0V

**PJ2 (MAIN) ↔ PJ450 (FAN)**

1	STANDBY_3.3V	+3.3V
2	GND	0V
3	I <sup>2</sup> C_SCL (3.3V)	0V to +3.3V (Pulse)
4	I <sup>2</sup> C_SDA (3.3V)	0V to +3.3V (Pulse)
5	Remote Control	0V to +3.3V
6	GND (FAN)	0V
7	STANDBY_13V(FAN)	+13V
8	FAN Drive	1V to +13V (Pulse)
9	N.C.	

**PJ3 (MAIN) ↔ LAMP DRIVER**

1	Lamp ON/OFF	OFF(0V) / ON(+5V)
2	GND	0V
3	Lamp Error	OK(0V) / NG(+5V)

**PJ400 (MAIN) ↔ TERMO SWITCH**

1	STANDBY_4V(IN)	+4V
2	STANDBY_4V(OUT)	+4V

**PJ401 (MAIN) ↔ POWER SUPPLY**

1	STANDBY_4V	+4V
2	STANDBY_4V	+4V
3	STANDBY_4V	+4V
4	GND	0V
5	GND	0V
6	GND	0V
7	STANDBY_6V	+6V
8	STANDBY_6V	+6V
9	STANDBY_6V	+6V
10	GND	0V
11	GND	0V
12	GND	0V
13	STANDBY_13V	+13V (AUDIO)
14	GND	0V
15	STANDBY_13V	+13V (FAN)
16	STANDBY_13V	+13V (FAN)
17	GND (FAN)	0V
18	GND (FAN)	0V
19	STANDBY_18V	+18V
20	STANDBY_18V	+18V
21	GND	0V
22	GND	0V
23	FAN Power	ON(H) / OFF(L)
24	GND	0V

**PJ502 (MAIN) ↔ Exhaust FAN (Power Supply)**

1	FAN Power	+13V
2	FAN Drive	1V to +13V (Pulse)
3	N.C.	
4	N.C.	

**PJ503 (MAIN) ↔ Exhaust FAN (Lamp)**

1	FAN Power	+13V
2	FAN Drive	1V to +13V (Pulse)

**PJ504 (MAIN) ↔ Cooling FAN (Optical Engine)**

1	FAN Power	+13V
2	GND (FAN)	0V
3	FAN Error	0V to +5V (OK:Pulse / NG:Stable)

**PJ851,PJ901,PJ951 (MAIN) ↔ LCD PANEL**

1	VSSY	0V
2	DIRY	0V / +15.5V
3	DY	0V to +15.5V (Pulse)
4	LCCOM	+6V
5	NRS	+2V to +8V
6	VID12	+2V to +12V (Video)
7	VID11	+2V to +12V (Video)
8	VID10	+2V to +12V (Video)
9	VID9	+2V to +12V (Video)
10	VID8	+2V to +12V (Video)
11	VID7	+2V to +12V (Video)
12	VID6	+2V to +12V (Video)
13	VID5	+2V to +12V (Video)
14	VID4	+2V to +12V (Video)
15	VID3	+2V to +12V (Video)
16	VID2	+2V to +12V (Video)
17	VID1	+2V to +12V (Video)
18	VSSX	0V
19	DIRX	0V / +15.5V
20	ENB1	0V to +15.5V (Pulse)
21	ENB2	0V to +15.5V (Pulse)
22	DX	0V to +15.5V (Pulse)
23	CLX	0V to +15.5V (Pulse)
24	CLX(-)	0V to +15.5V (Pulse)
25	VDDX	+15.5V
26	VDDY	+15.5V
27	NRG	0V to +15.5V (Pulse)
28	CLY	0V to +15.5V (Pulse)
29	CLY(-)	0V to +15.5V (Pulse)
30	DY	0V to +15.5V (Pulse)

**PJ990 (MAIN) ↔ OPTICAL ENGINE**

1	STANDBY_3.3V	+3.3V
2	I <sup>2</sup> C_SCL(3.3V)	0V to +3.3V (Pulse)
3	I <sup>2</sup> C_SDA(3.3V)	0V to +3.3V (Pulse)
4	GND	0V

**PJ451 (FAN) ↔ PJ551 (REM)**

1	STANDBY_3.3V	+3.3V
2	GND	0V
	Remote Control	0V to +3.3V

**PJ452 (FAN) ↔ Intake FAN**

1	FAN Power	+13V
2	FAN Drive	1V to +13V (Pulse)

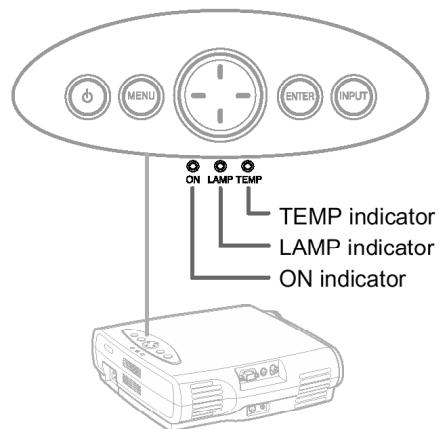
**PJ602 (AUDIO) ↔ SPEAKER**

1	AUDIO(+)	1V
2	AUDIO(-)	0V

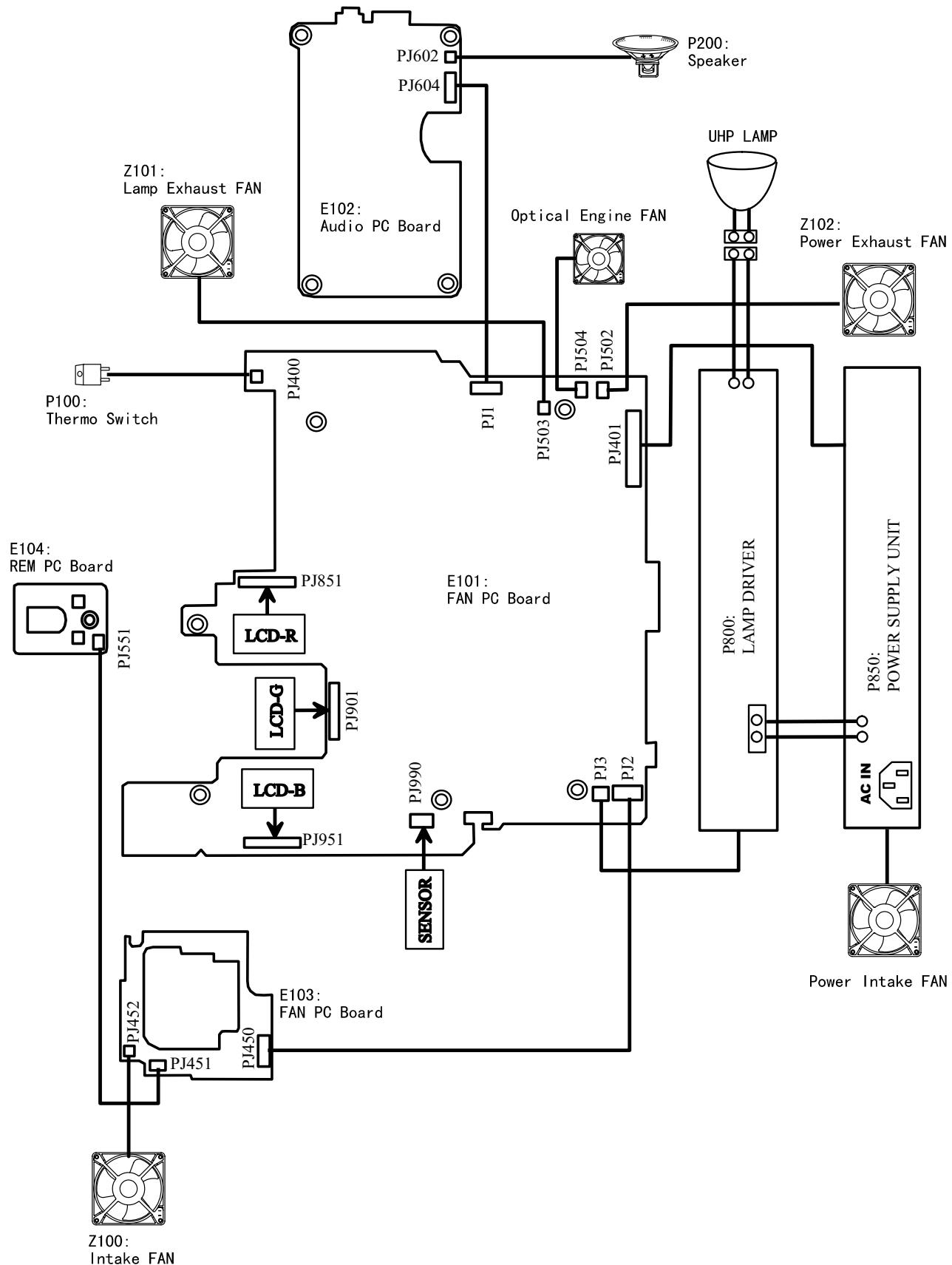
### 3. LED DISPLAY (Problems Shown on Indicator Light)

Status of Indicator Light			Description and Cause	Solution
ON	LAMP	TEMP		
-	-	-	Standby-power is not on. -> There's a problem with the power unit or system microcomputer.	Unplug the power cord and contact your TOSHIBA dealer.
Red	-	-	Power is not on. -> There's a problem with the system microcomputer.	Unplug the power cord and contact your TOSHIBA dealer.
Red	Red	-	The lamp went out during use or the lamp will not switch on. • The bulb has reached the end of its life.	• Replace it with a new bulb. Unplug the power cord and contact your TOSHIBA dealer.
Red	Orange	-	The power went off during use, or the power will not switch on. -> The lamp-exhaust fan is not working.	Unplug the power cord and contact your TOSHIBA dealer.
Red	(Red)	-	The power will not switch on. -> The lamp cover is not closed.	Close the lamp cover.
Red	(Orange)	-	The power went off during use, or the power will not switch on. -> The lamp has overheated.	• Make sure that the openings for the intake and exhaust fans are not blocked. • Clean the air filter.
Red	-	(Red)	The power went off during use, or the power will not switch on. -> The Intake fan is not working.	Unplug the power cord and contact your TOSHIBA dealer.
Red	-	(Orange)	The power went off during use, or the power will not switch on. -> The Power-exhaust fan is not working.	Unplug the power cord and contact your TOSHIBA dealer.
Red	Green	(Red)	The power went off during use, or the power will not switch on. -> The Lamp-exhaust fan is not working.	Unplug the power cord and contact your TOSHIBA dealer.
Red	Green	(Orange)	The power went off during use, or the power will not switch on. -> The optical engine fan is not working.	Unplug the power cord and contact your TOSHIBA dealer.
Red	-	Red	The power went off during use, or the power will not switch on. -> The projector has overheated.	• Make sure that the openings for the intake and exhaust fans are not blocked. • Turn off the power, let the projector sit for a while, and then turn it on again. • Clean the air filter.
Red	-	Orange		
Red	Green	Red		
Red	Green	Orange		

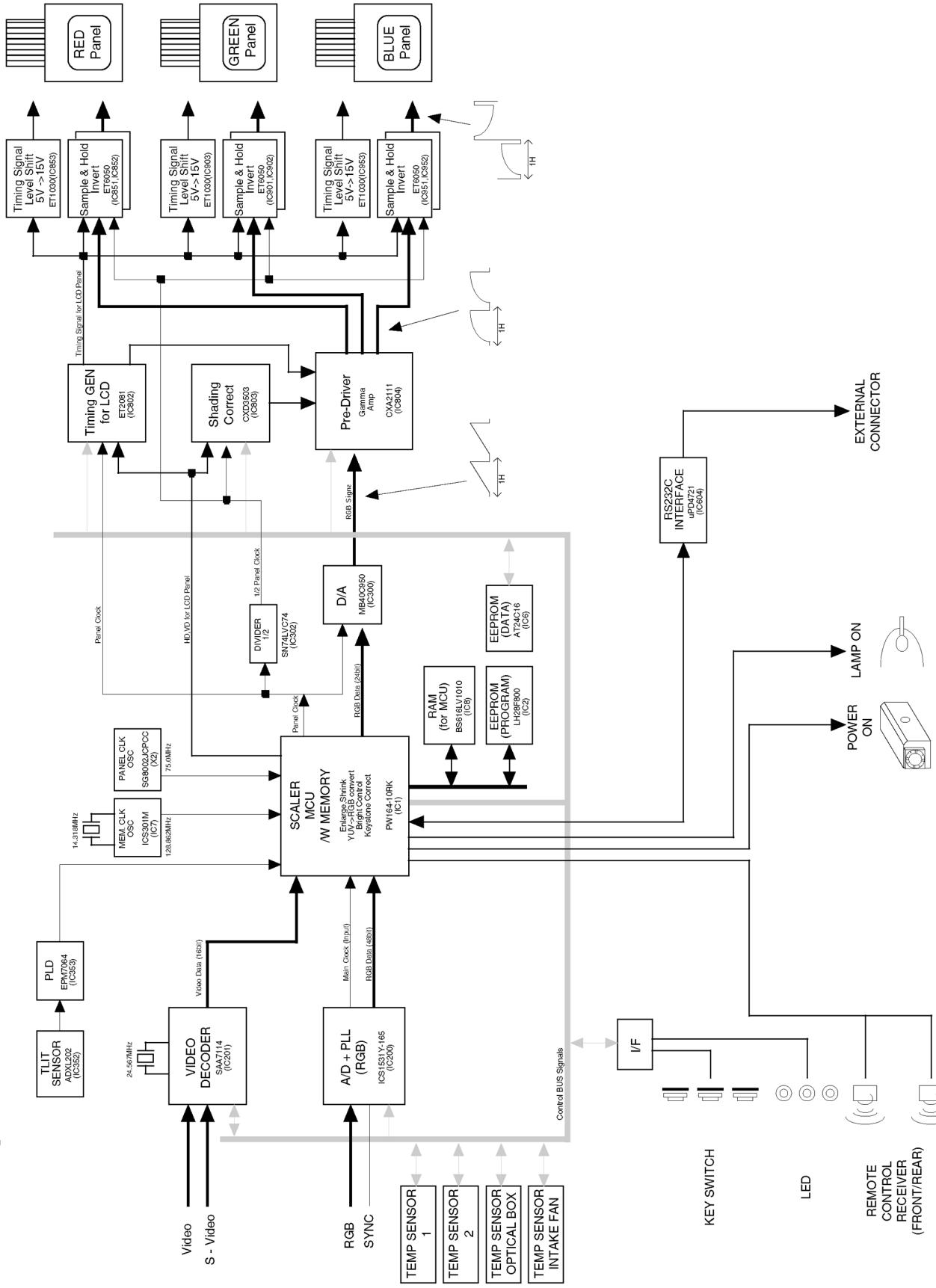
(Red) : Red flashing, (Orange):Orange flashing



## 4.BLOCK DIAGRAM



## Block Diagram of Main Board (TLPB-B2)



# SECTION3

## PARTS LIST

### SAFETY PRECAUTION

The parts identified by ! mark are critical for safety. Replace only with part number specified.

The mounting position of replacement is to be identical with originals.

The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

### NOTICE

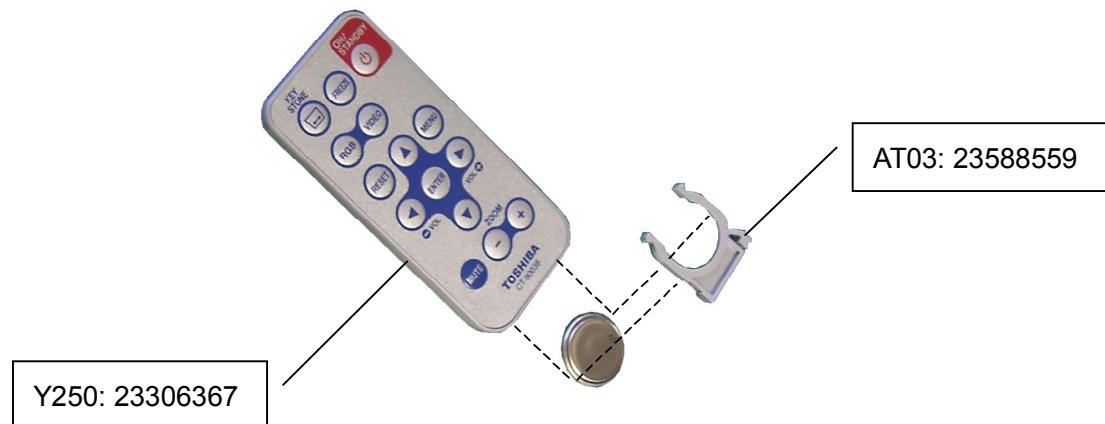
The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.

Parts marked # are of chip type and mounted on original PC boards.

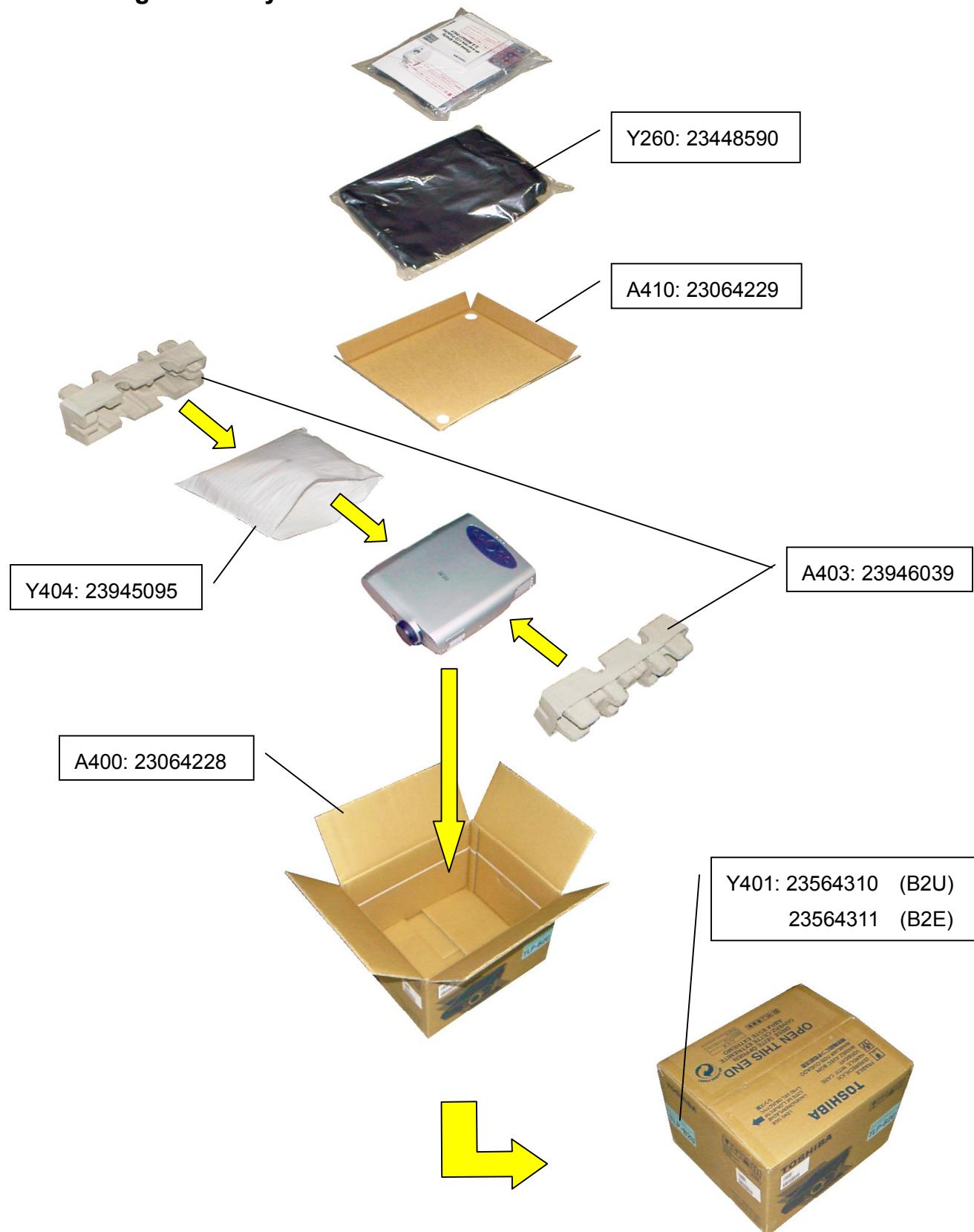
However, when they are placed for servicing works, use discrete parts listed on the parts list.

### 3. EXPLODED VIEWS

#### 3-1. Remote Control Unit



### 3-2. Packing Assembly



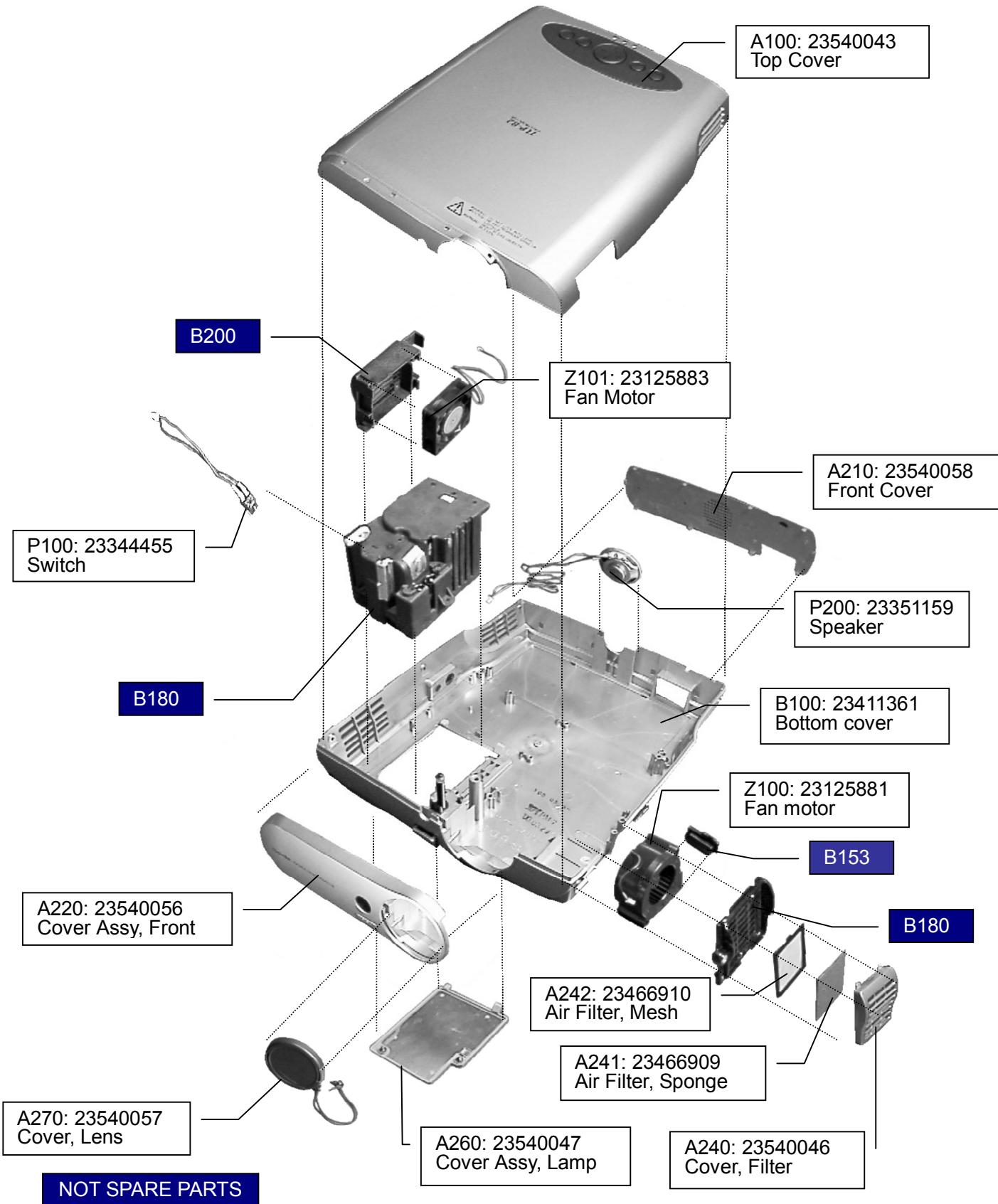
[Note] Refer to page 3-8 for parts description.

### 3-3. Accessories

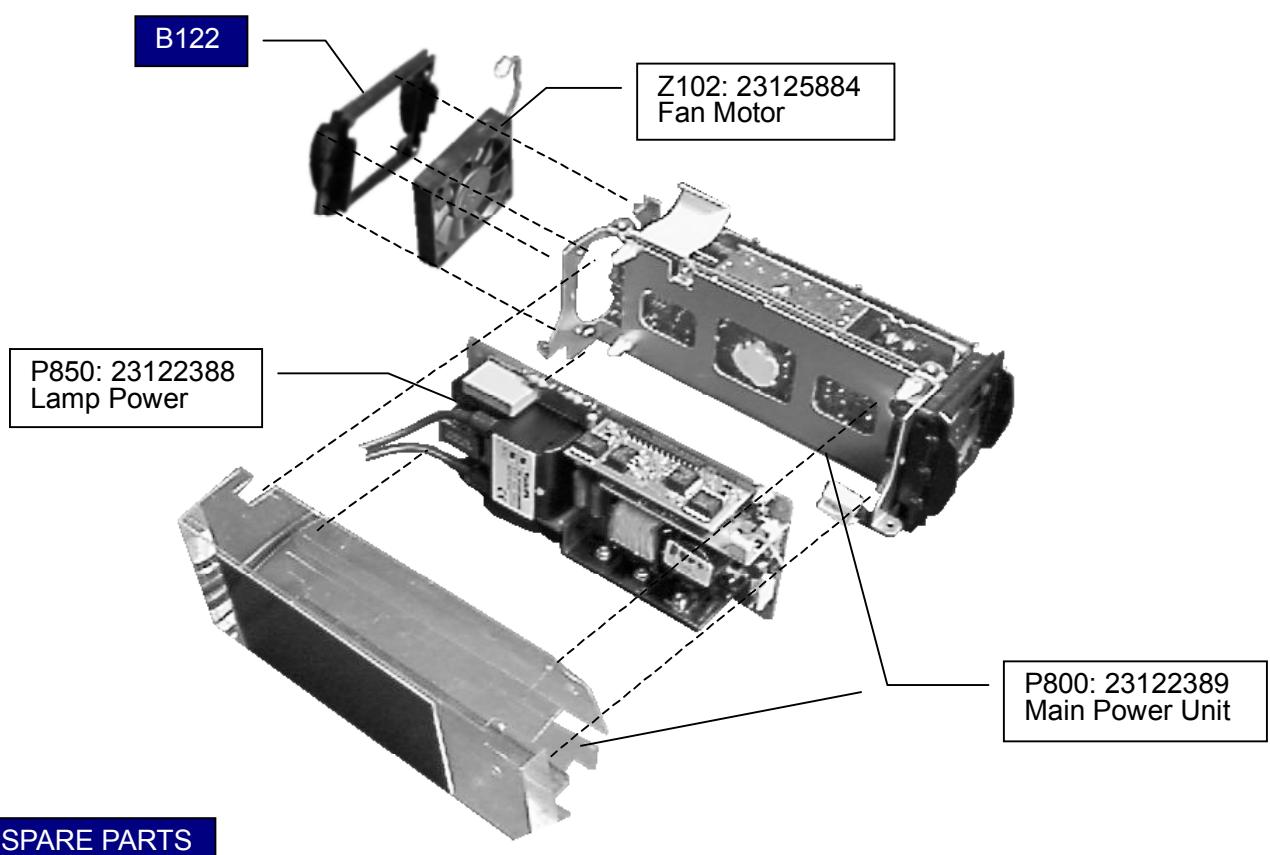
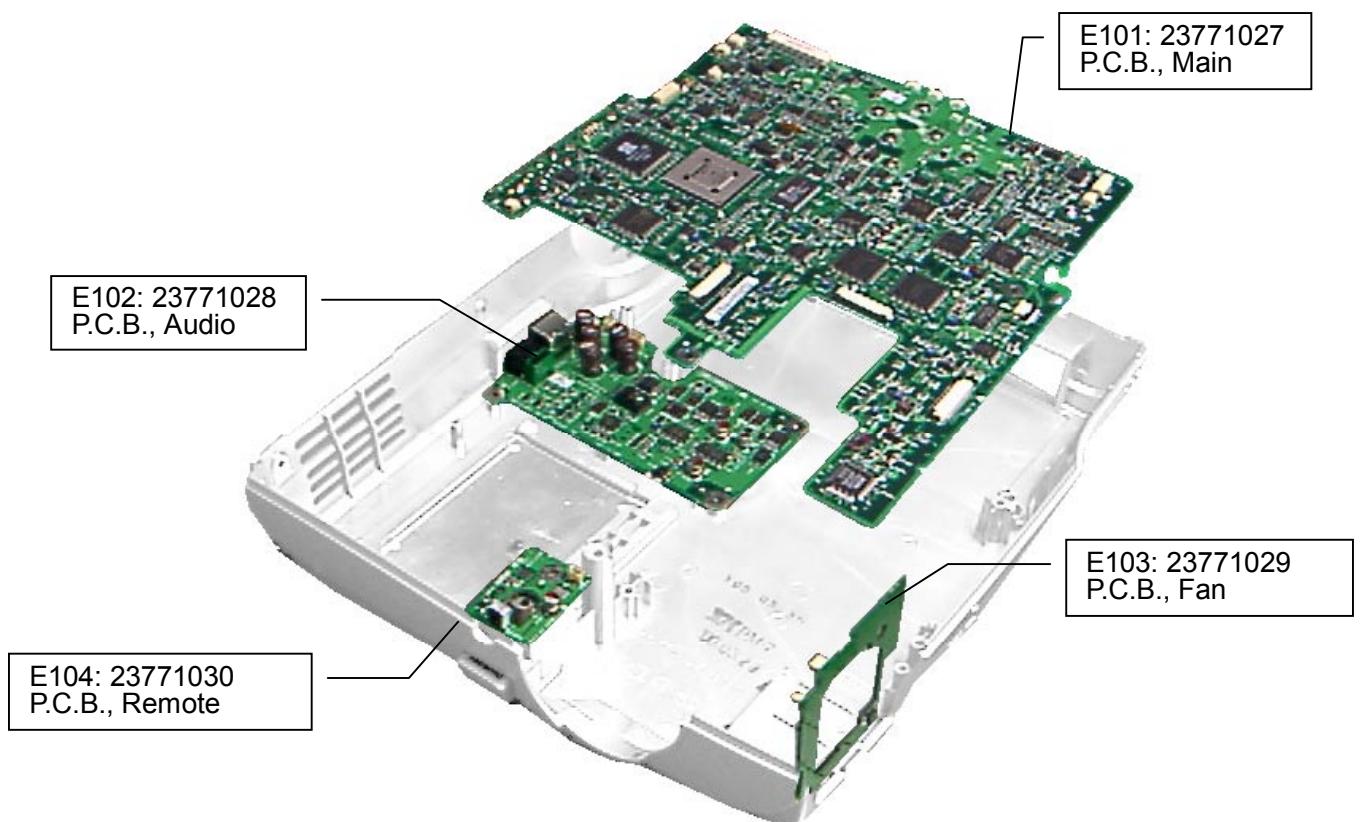


PARTS NO	SN		PARTS NO	SN	
Y106	23368676 Din8P-Dsub		Y200	23563936 CD-ROM	
Y294	23368752 Audio Cable		Y201	(for B2U) 23563933 (for B2E) 23563934 (for B2C, TXP) 23563989	
Y105	23368733 PC Audio Cable		Y207	(for B2E) 23563935	
Y293	23368571 Video Cable		Y210 Y211 Y212 Y213 Y214 Y215	23589124 23589125 23589126 23589127 23589128 23589129	
Y102	23368750 RGB Cable		Y202	23956184 Sticker, Cable	
Y110	23368679 Mac Adapter		Y203	23956185 Sticker, Function	
Y205	(for B2U) 23372144 (23372148)		Y119	23589121	Accessories List
	(for B2E) 23372145 (23372147)		Y260	23448590 Soft Case	
Y206	(for B2E) 23372149		Y250	23306367 Remocon	

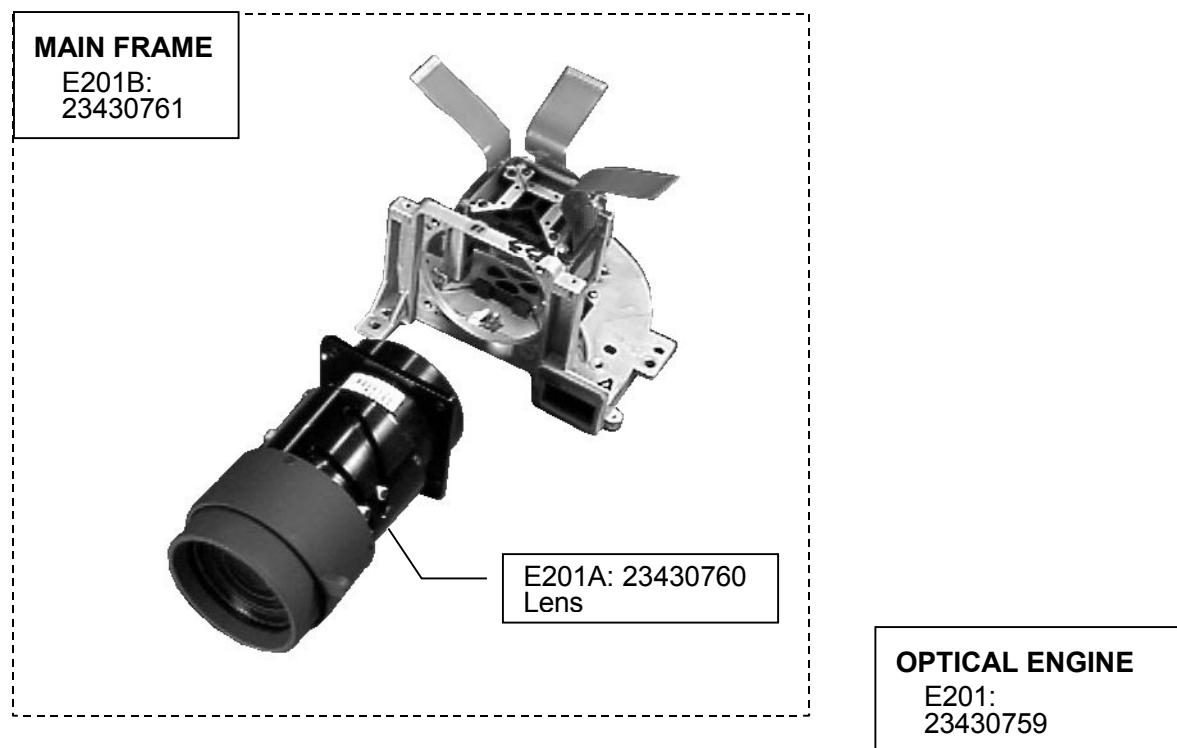
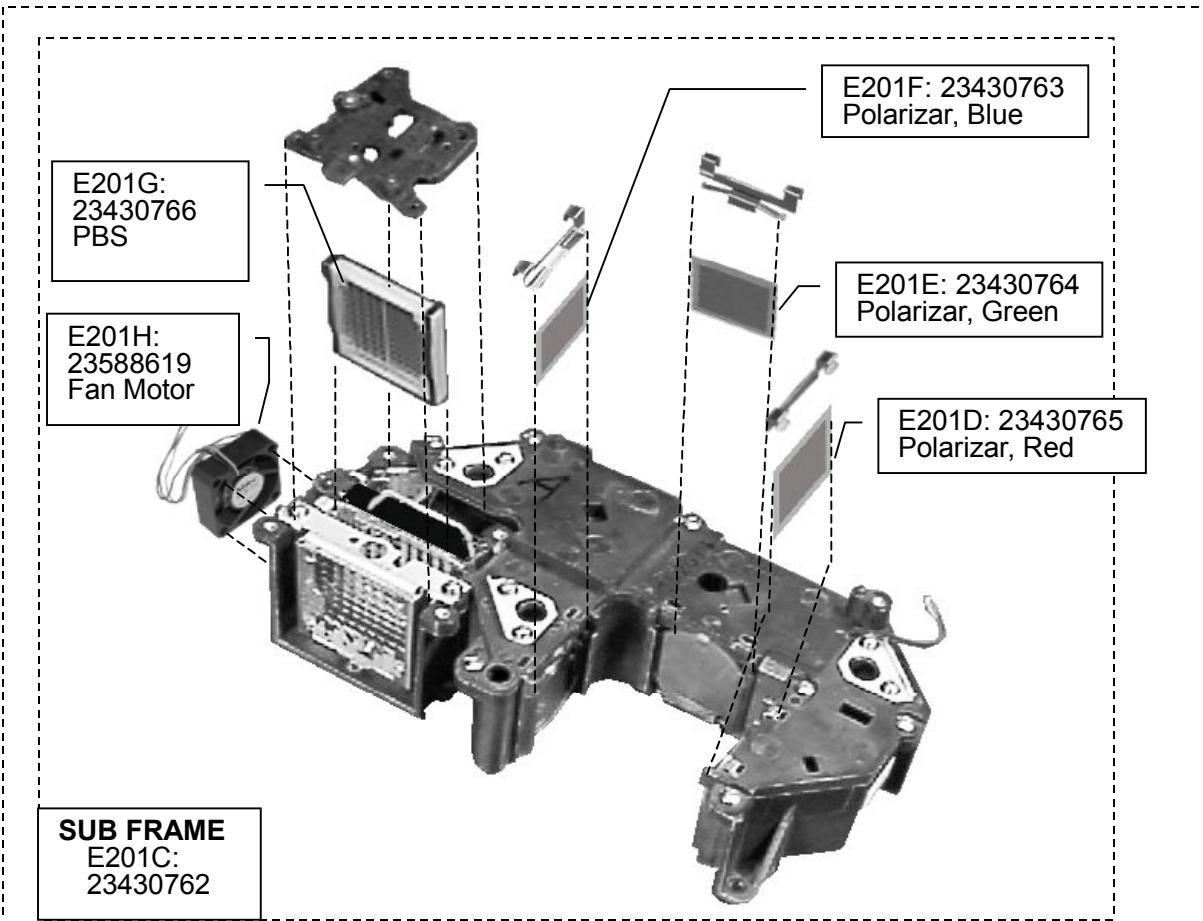
### 3-4. Chassis Assembly



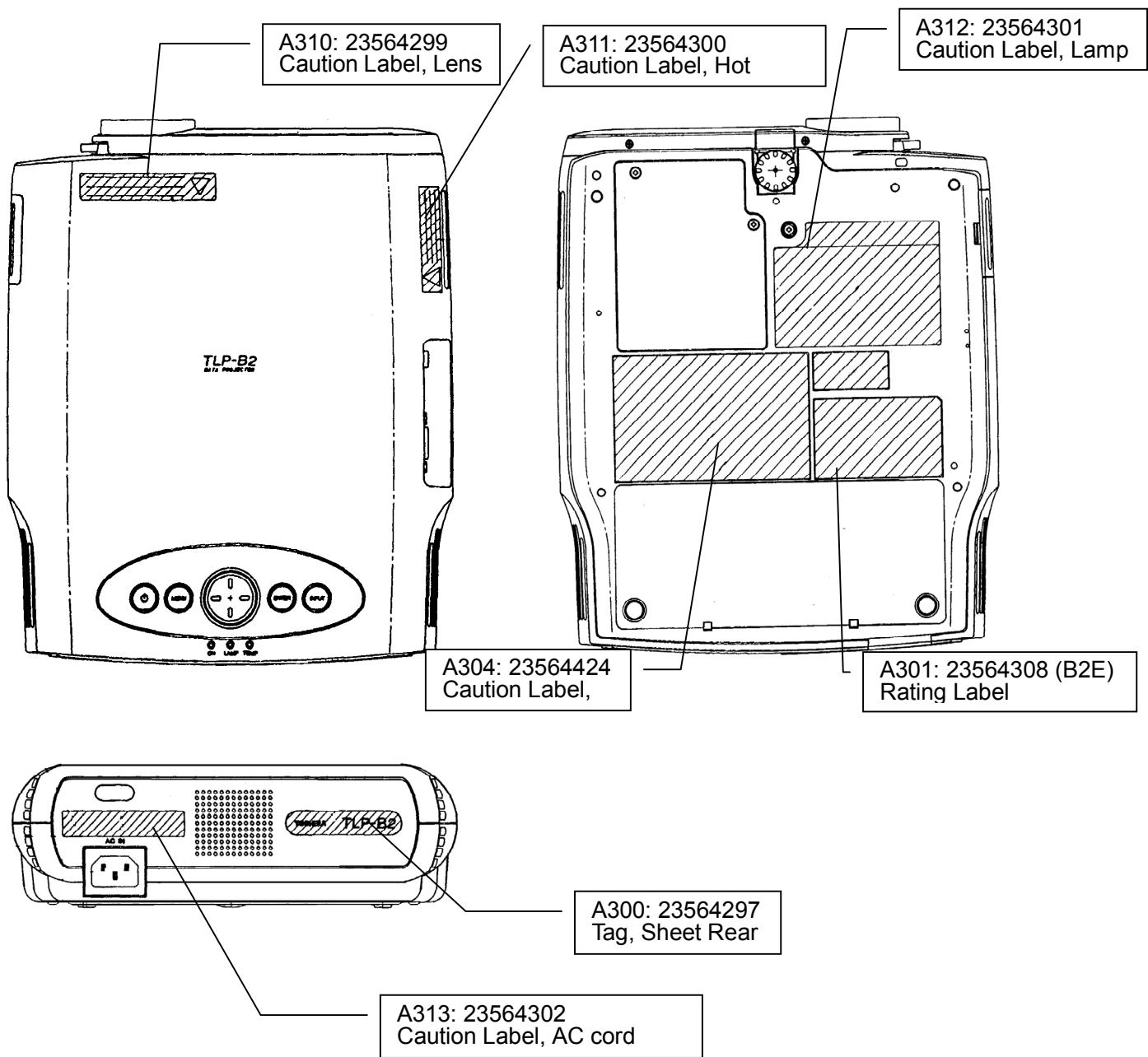
### 3-5. PC Board and Power Unit Assembly



### 3-6. Optical Engine Assembly



### 3-7. Labels



## 4. PARTS LIST

LOCATION NUMBER	PARTS NUMBER	DESCRIPTION	LOCATION NUMBER	PARTS NUMBER	DESCRIPTION
- MECHANICAL PARTS -					
A100	23540043	Top Cover	Y102	23368750	RGB Cable
A210	23540058	Rear Panel	Y105	23368733	Audio Cable (Stereo Mini)
A220	23540056A	Front Cover	Y106	23368676A	Serial Cable
A240	23540046	Filter Cover	Y110	23368679	Mac Adapter
A241	23466909	Air Filter (SPONGE)	Y119	23589121	Sheet Accessory
A242	23466910	Air Filter (MESH)	Y200	23563936	Owner's Manual CD-ROM
A260	23540047	Lamp Cover	Y201	23563933	Owner's Manual (E/F)
A270	23540057	Lens Cap	Y201	23563934	Owner's Manual (E)
A300	23564297	Label Rating	Y205	23372145	Power Cord (E) 250V/6A
A301	23564308	Label Rating (E)	Y205	23372147	Power Cord (E) 250V/6A
A301	23564298A	Label Rating (U)	Y205	23372144	Power Cord (U) 125V/10A
A304	23564424	Label Caution Bottom	Y205	23372148	Power Cord (U) 125V/10A
A311	23564300	Label Caution Hot	Y206	23372149	Power Cord (UK) 250V/5A
A312	23564301	Label Caution Lamp Change	Y207	23563935	Owner's Manual (F/G)
A313	23564302	Label Caution AC Cord (U/E)	Y210	23589124	Quick Manual (E)
A400	23064228	Carton Box	Y211	23589125	Quick Manual (F)
A401	23564310	Label Carton Box (E)	Y212	23589126	Quick Manual (G)
A401	23564303	Label Carton Box (U)	Y213	23589127	Quick Manual (S)
A403	23946039	Packing	Y214	23589128	Quick Manual (I)
A404	23945095	Set Cover	Y215	23589129	Quick Manual (P)
A410	23064229	Carton Partition	Y202	23956184	Sticker Cable Tag
AT03	23588559	Remote Control Battery Cover	Y203	23956185	Sticker Name Tag
B100	23411361	Bottom Cover Assy	Y250	23306367	Remote Control Unit
P100	23344455	Switch	Y260	23448590	Soft Case
P200	23351159	Speaker	Y293	23368752	Cable Audio
P800	23122389	Power Unit APS-143	Y294	23368751	Cable Video
P850	23122388	Power Unit UHP120W-U-DRI			
Z100	23125881	FAN BM5125-04W-B50			
Z101	23125883	FAN 109P0512A702	E201	23430759	Optical Engine
Z102	23125884	FAN D05X-12TM 09	E201A	23430760	Lens
			E201B	23430761	Optical Parts (Main Frame)
			E201C	23430762	Optical Parts (Sub Frame)
E101	23771027	Main PC Board	E201D	23430763	Polarizer (R)
E102	23771028	Audio PC Board	E201E	23430764	Polarizer (G)
E103	23771029	FAN PC Board	E201F	23430765	Polarizer (B)
E104	23771030	REM PC Board	E201G	23430766	PBS block
			E201H	23588619	Cooling FAN
			E202G	23301370	LCD Panel P09XG220 (G)
E205S	23430870	Panel Holder Service Kit	E201G	23301373	LCD Panel P09XG210 (G)
M005S	23588620	10p Extension Cable			
M100S	23588552	Service Kit (include Extension Cable)			

**TOSHIBA CORPORATION**

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN